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NOTES AND COMMENTS.

The weather during the past month has been exceptional. As will be seen from the rainfall reports, there has been very little rain, while we experienced exceedingly cold and frosty weather for nearly three weeks. This has done considerable damage to the feed and early potato crops, while the late-sown wheat has also been affected in some districts. The early crops have, however, apparently held their own well, and with favorable weather will make good progress. We are now, however, at a critical time, and a good soaking rain is badly needed, as in many districts the rain we have had has not penetrated deeply enough to carry the crop through a spell of hot weather.

In view of the damage that has been done to potato crops during the past few weeks by frost it may be stated that Professor Bailey, the well-known horticultural authority, asserts that damage by ordinary light frosts can be prevented by thoroughly spraying the plants at *nightfall* when a frost is expected. It is contended that anything that will add moisture to the atmosphere and prevent the rapid radiation of heat from the soil will prevent injury, except with very heavy frosts. Constant stirring of the soil and mulching assist in preventing damage.

The 4bush. bag of wheat must go in time. If men possessed of phenomenal brute strength care to carry 240lbs. to 260lbs. all day up a plank, they can easily satisfy their desire by carrying two 2bush. bags; but it is safe to say that a light, strong, active man will carry as much in 2bush. bags during a day as can be carried in 4bush. bags by a strong slow man, and the wear and tear all round will be much less when lighter bags are used. The lumpers at the wheat stacks are not the only men to be considered in this matter. Many farmers—perhaps the great majority—are not "mountains of muscle," and should not be subjected to the imminent peril of rupture in order that exceptionally strong men may enjoy a monopoly of stacking heavy bags of grain at the railway depôts.

It would be useful and interesting to try experiments with hand-thrashed and stripped wheat for seed purposes. It has often been asserted that the seed harvested by the stripper, although apparently perfectly sound, fails to germinate more than one-half of the quantity sown, whilst hand-thrashed seed germinates in nearly every case. Under proper conditions every grain of seed put into the soil ought to produce a plant; but if this were so half a bushel of seed would be a deal too much for an acre of land, if we admit that a square foot at least is required for the perfect development of a plant of any cereal.

Last season Queensland produced about 167,000 tons of sugar and New South Wales about 24,000 tons. It is estimated that the consumption of sugar in Australia is 188,000 tons, so that the two sugar-producing colonies have an excess over local requirements of 3,000 tons; besides this Fiji exported 31,000 tons, so that with the prospect of federation, and consequently inter-colonial free trade. at an early date there appears to be no opening for the profitable employment of capital in the production of beet sugar.

Very many fruit trees are ruined through "sun scald." During the hottest weather the call upon the roots for "more moisture" becomes increasingly urgent, and in the afternoon the supply is not nearly sufficient. Transpiration of water through the bark on the stems and large limbs is not sufficient to keep down the temperature of the bark, the circulation slows down, and the sap becomes excessively hot, and consequently the bark on the side next the afternoon sun is killed. To prevent this, either a good lot of water must be supplied, or the trunks of the trees must be shaded against the afternoon sun with palings or some other contrivance.

Peach aphis lives upon the roots of the trees all the year round, and also upon the twigs and branches during the growing season. The natural remedy, therefore, is to destroy the insects, as far as is possible, upon the roots during the dormant season of the trees. The best time is during July and August. Bare the roots of the trees completely for about 9in. around the stem; throw the soil away. Swab the roots with a decoction made with 3ozs. of tobacco waste and 3ozs. of soap in 1gall. of boiling water; return fresh soil in place of that thrown out, and spray the tree with the same decoction as recommended for the roots. As an additional precaution, wrap paraffined paper or brown paper around the stem, just above the soil, and with a brush, apply "tanglefoot" on the outside of the paper. A mixture of castor oil and Stockholm tar is reported to keep sticky for a considerable time. Castor oil and powdered resin boiled to a sticky mass may also answer. The most effective treatment when the insects are found on the trees is fumigation by means of tobacco fumes. An ordinary calico tent is placed over the tree and a few ounces of damped tobacco waste is burned underneath on live coals. If the tent is left on for thirty or forty minutes every insect will be destroyed.

A "Direct-supply Fruit Co." has been started in Sydney, with Mr. H. Sparks as manager, in the Queen Victoria market. Fruit can be ordered through the company direct from the orchard, and four varieties may be supplied in one case, separated. This should be a good hint to growers who object to the interference of middlemen.

Nearly every colonist in Australasia who is at all concerned in the cultivation of the soil acknowledges the great work that has been done, and is still being carried on, by Mr. Charles French, F.L.S., the Victorian Government Entomologist, and all will be grieved to learn that a certain "Board" has recommended that his department shall be reduced in status. It is to be hoped that that recommendation will not be adopted by the Victorian Government.

A Victorian farmer found that the underside of his ploughshare points wore away rapidly, which made it difficult to keep the plough in the ground. He remedied this by heating the share to white heat, then rubbed a piece of cast iron at same temperature on the under side of the share, and finally threw the share into cold water. This left a coating of very hard chilled iron on the share point, which lasted a long time.

To ensure seeds germinating, or trees or plants taking root, in any sort of soil, but particularly in light soil, roll or tread it down at once, but not too heavily. This places the soil in direct contact with the seeds or roots. But when the plants are growing, it is necessary to loosen the soil to let in a certain amount of air. If broken up roughly, in clods, there will be too much air and the soil will become too dry. Break it up finely, and in such a manner that the roots of the plants shall not be injured. No plant can thrive in a dense compact soil, where air can hardly obtain an entrance, or in a soil which is waterlogged for any length of time. "Cultivation," or loosening of the surface frequently is nearly as good as irrigation, as it enables the soil to absorb a deal of moisture from the air, as well as other matters necessary to the welfare of the plants.

It would be interesting matter for discussion amongst Branches of the Agricultural Bureau as to which is the most practically useful and profitable animal on the farm. The horse gives its labor for a number of years, and then becomes slow and slower, and less and less useful, and when it dies is often buried with its skin on. The cow gives milk for a good long time, produces a calf yearly, and, when she gets old, may be fattened and sold for some innocent people to consume in the form of beef, and her skin is taken off for leather. The sheep gives a yearly clip of wool, the females produce a lamb once a year, and the sheep, when aged, are slaughtered for mutton. The pig is awfully prolific, eats almost anything that can be eaten as food, and floods the market with hams and bacon, besides filling the midden with rich manure. The hen lays about 200 eggs a year for four years, and is very handy for table purposes when mutton, beef, or pork, would not keep good through the heat of the weather. Now, which is the most practically useful and profitable animal on the farm?

The "best" of everything is always the cheapest in the long run. The best cow is that one which produces the largest quantity of richest milk at the smallest cost for food and care during each twelve months. The same rule applies all through the list of live stock—the largest return of best quality at least cost and trouble. There are some implements which will do twice as much work as others at less than half the cost of labor. Five pounds less draught on a plough makes a great difference in the cost of exertion on the part of the animals working it, and this enables them to do more work, to work a longer time, and consume less food. It is much better to cultivate and manure 400 acres thoroughly than to "slum" over 1,000 acres for the same quantity of crop.

Singling mangolds and beets and thinning out crops of turnips, &c., is often left till too late or forgotten altogether, with the result that the crops are next to worthless. Many persons who have been sowing seeds of these plants for the first time seem to be unaware of the fact that the seed-pods of mangolds and beets contain more than one seed; but not more than one plant should be allowed to grow at each interval in the rows.

A producers and consumers' company is now being formed under the title of "The South Australian Fruit and Vegetable Company, Limited," with a view to establishing a large produce depôt near the Adelaide Railway Station, where a site has already been fixed upon by arrangement with the Railways Commissioner. At these premises growers will leave their produce to be dealt with by a competent manager and assistants, and the producers will be relieved of the necessity for hanging about the market for many hours, and will probably obtain higher-prices for their produce, whilst consumers will have to pay less for all they require. A short line of rail to the packing houses will do away with the necessity for trolleys running to the goods sheds, and produce can be packed direct into the trucks for transport to any point on the railway system.

When sugargums are planted to shelter orchards and gardens against prevailing winds they will injure the nearest trees, &c., if within a chain distance, by robbing the soil of moisture and nutriment, but if a trench is dug and the roots of the gums are cut away once in every five years the shelter belt may be planted within 20ft. of the orchard or garden. If three or four rows are planted at 6ft. apart, then remove each second tree when five years old, the trees will make good timber. If utility is the object, plant olives, carobs, or almonds.

The Americans like to change established nomenclature and to invent new idioms and phrases. Beetles are called "bugs," caterpillars "worms," the luscious pomelo orange they call "grape-fruit," and the kaki or Japan date-plum is miscalled "persimmon." Their reason for this latter outrage is that they have one of the hundred species of Ebenaceæ indigenous to the States, called Diospyros Virginiana, which bears a vile astringent fruit called persimmon. There are quite a number of varieties of kaki or date plum cultivated in Japan, China, and India for the sake of their delicious fruits, which are not only eaten in their natural ripe condition, but are dried, made into sweetmeats, and otherwise prepared. There is no reason for adopting the name "persimmon," in place of the old and well-known "date-plum"; but if the name must be altered, let us adopt "kaki," which is the proper botanical appellation for the fruit.

THE BABCOCK MEMORIAL.

A movement is on foot to recognise in some tangible way the very valuable services rendered to the dairying industry by Professor S. M. Babcock, of the Wisconsin Agricultural Experiment Station. Professor Babcock is the inventor of the milk test system which bears his name, and which has done so much for the advancement of the industry. For this and other inventions he refused to take out patents; consequently dairymen throughout the world have benefited from the inventive genius of the Professor without the latter reaping any monetary reward. The various investigations in the science and practice of dairying undertaken by the Professor in the course of his work have been of immeasurable value to the industry, not only in the United States, but also throughout Australasia, and it is felt by many prominently connected with the industry that local dairymen should be afforded an opportunity of showing their appreciation of the value of Professor Babcock's services. Mr. J. L. Thompson, the New South Wales Agricultural Instructor, has taken the matter up, and asked the editor to publish an appeal to South Australians interested in dairying. Mr. R. Caldwell, M.P., Chairman of the Dairy Board, has agreed to take charge of subscriptions from our factories and others interested. Subscriptions should be forwarded to Mr. Caldwell, at Woodside, or at Parliament House, Adelaide.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J. Perkins, Government Viticulturist.

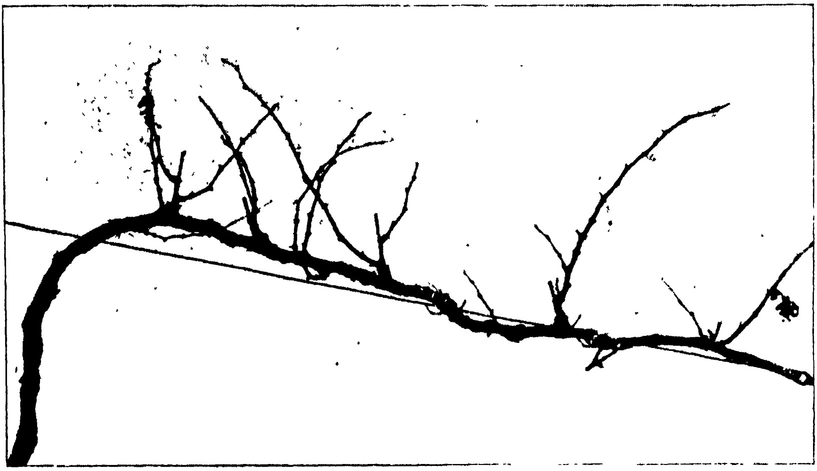
In spite of unprecedented frosts, perhaps even as a natural consequence of the semi-arctic weather with which we have been favored, July has been anything but seasonable. I much question whether all our records can show a dryer midwinter month. To murmur against circumstances over which we can have no control is, I am aware, of little avail, but it is as well to recognise our position from the beginning instead of vaguely dreaming over the possibilities of a favorable season. The vine, be it understood, is a plant that rejoices in wet winters and comparatively dry springs and summers; hence the secret of its success under our extraordinary climate. The general tardiness of our winter cultivation shows that we are too apt to rely on those spring rains that rarely come. The latter, it is true, so far as the growth of the plants is concerned. might to a certain extent practically make up for the deficiency in the winter fall, but given that they visited us in sufficient abundance they would generally be found to interfere with the fruiting of the plants. Undoubtedly, however, after an uncomfortably long succession of dry years in most vineyards good wood will be more in demand than fruit, so that after going through a winter that might well recall summer in its dryness we can but hope for a summer of winter wetness. It cannot be too strongly impressed on all that from all appearances we are in for another dry year, and that in consequence it is imperative that the soil of our vineyards receive the very best of tillage.

⁂ ⁂ ⁂

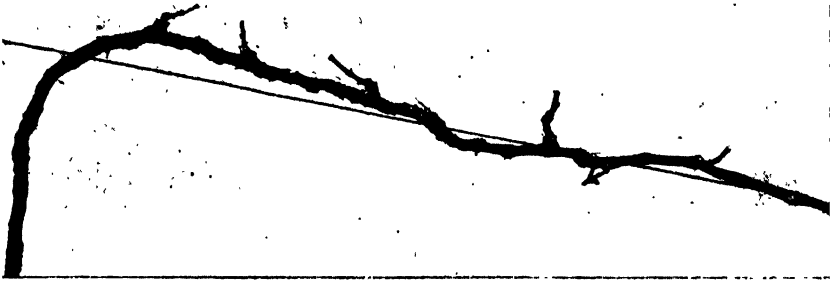
I cannot let the winter go by without a last word on that vexed question, winter cultivation. Readers of the *Journal* may be well tired of the subject; but in spite of the space devoted to it at different times, it is still so neglected, so ill-understood, that I must run the risk of wearying the patience of the better informed. Vinegrowers might be divided into various classes, according to their attitude towards this all-important question. There are some, a good many, I am afraid, who do not believe in winter cultivation at all; the vineyards of the latter present a hardened surface to the winter rains, peacefully reposing until all hope of further rain is passed away. To them the fall of the winter moisture can have no special significance; nay, perhaps it may be irksome—it softens the weather and forces on the growth of weeds. And of course weeds must be destroyed; in fact, that is the sole object of cultivation.

I.

VINE AFFECTED BY HAIL AND SUMMER PRUNED.



A. Before Winter (1899) Pruning.



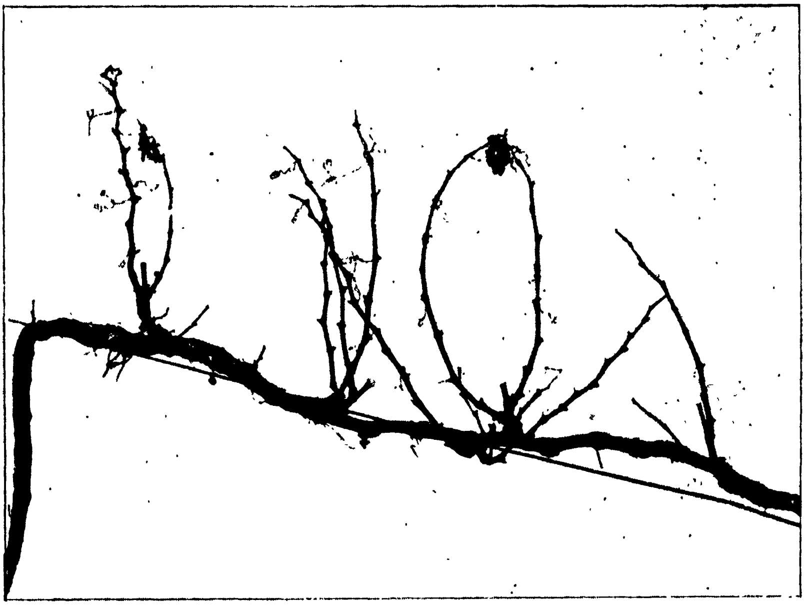
B. After Pruning.

Grow, weeds, grow; were it not for you half the vineyards in South Australia would remain untilled. The sleep of such is too deep to be broken by my feeble exhortations. Sleep on till September, and prosper.

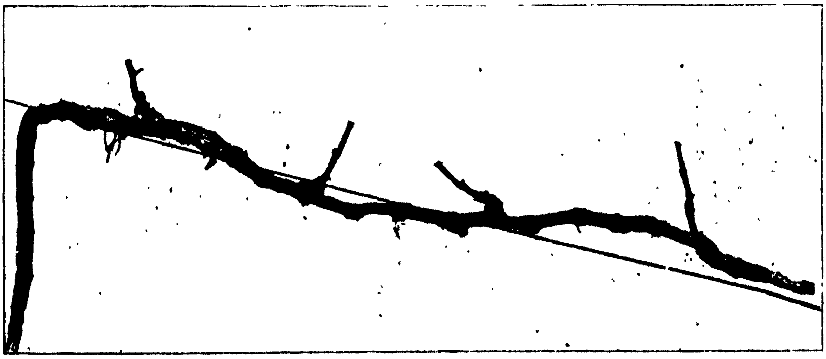
There are others, again, to whose minds the importance of winter tillage has successfully appealed. The soil must be broken up to receive the winter rains; but surely 1½in. to 2in. of loose soil will absorb all that can fall. We will plough on a 2in. to 3in. furrow, and shall be immeasurably superior to our sleeping brethren; hence, as I have had occasion to witness, winter ploughing with a double-furrow and a single horse, or a three-furrow and two horses. This is good early cultivation! To you, then, who are awake, albeit somewhat drowsy, let me say that this is not good early cultivation. Your vineyards are young, and as yet show good growth, but the days are not far off when they will be on a par with those of the sleeping fraternity. Yes, I know the roots are on the surface, but they should not be there, and the sooner you send them down into the subsoil the better. I have some hopes that with the opening of

II.

VINE AFFECTED BY HAIL AND SUMMER PRUNED.



A. BEFORE WINTER PRUNING.



B. AFTER PRUNING.

the new century you will be thoroughly awakened and alive to a question that will have some influence on the measure of your success as vinegrowers.

And lastly, there are some few who have understood the question in all its bearings, who plough early and deep, not on 3in. furrows, but 6in. and 7in.; who put two horses on the single, and not one on the double or two on the five-furrow. Mark them well; they will succeed, but their success will be attributed to good land, exceptional district, and to everything but their own common sense and hard work.

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It has often been objected to me that early ploughing, however good and indispensable in flat plain land, becomes impossible in undulating and hilly country. The rains, it is said, would wash away the surface soil, and thus it is maintained with apparent regret that another wise irreproachable practice cannot possibly find its application in some of our best vine country. Mr. D. A. Lyall, of St. Andrews, has planted the vine in undulating hilly land, and has, to my knowledge, from the very beginning tilled his hill slopes early if not too deep. I had occasion to question him the other day on this very subject, and his answer was to the effect that he always ploughed the steepest slopes first, as the rain was then able to soak in, and showed less tendency to form wash-aways. It seems to me, therefore, that probably the gentlemen whose opinions I have quoted above have been arguing, not from personal experience, but from what they thought would most probably occur; or possibly, as in the case of the successful grower, Mr. Lyall's soil is of some special and rare texture, possessed of properties and virtues not vouchsafed to the more ordinary type.

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With August nominally the second ploughing should be commenced. The soil that through the winter should have lain rough and open to weathering atmospheric agencies can now be thrown back upon the vines on a shallower levelling furrow. Two horses on a double, or one horse on a single, will do the work comfortably and well; a 3in. or 4in. furrow will be ample, and the last furrow should be left in the middle. Where there are large areas to cover it is as well to throw back the first two furrows against the vines first, finishing up later on in the season; in this fashion may be avoided the danger of rubbing off the buds that the warm weather will soon bring to life.

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In my last month's notes I made reference to a new method of applying manure to vines, through the ends of the spurs. I had some rows treated in this fashion at the College vineyard. To a certain extent the effect has been marvellous. Some buds actually began to swell in the first week in July; the cold weather that has generally prevailed checked their growth considerably, but unfortunately many were sufficiently advanced to be frost-bitten during the late frosty nights. I must reserve further details for a later period.

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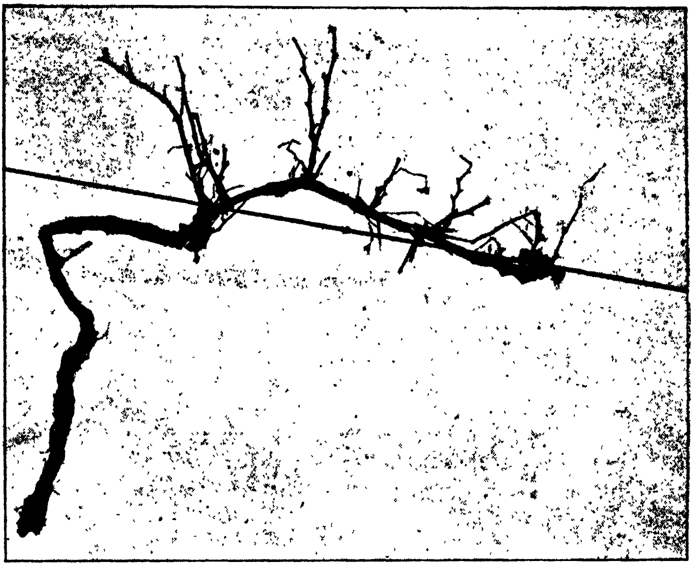
The photographs that accompany these notes were taken to illustrate the treatment of vines badly affected by hail in the early season. Unfortunately I only saw the vines in question some time after they had been affected by the hail, so that some days' growth was lost. The hailstorm occurred on the 28th of October, and the vines were treated on the 18th of November, that is to say rather late in the season; and, further, the vines are planted in rather poor soil, where even under ordinary conditions strong growth could not be expected.

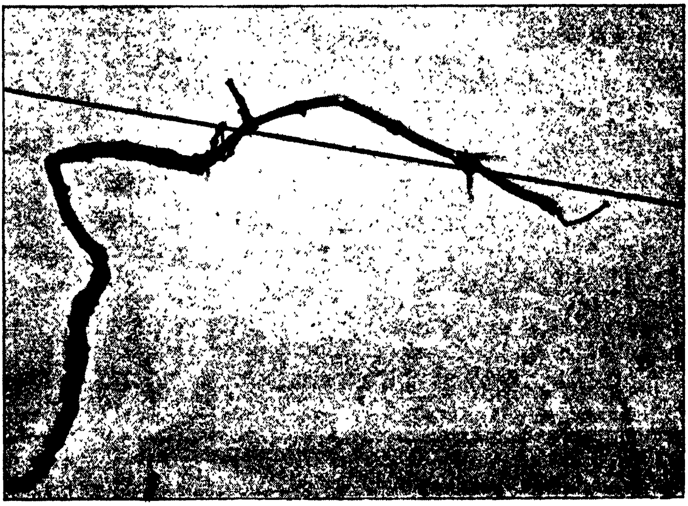
The hail completely stripped the vines of their leaves, and of course of their fruit; from the buds a host of weak laterals had begun springing, so that unless something was done there could be little hope of good wood for the following year. In consequence I advised that the vines be pruned as in winter, on short spurs, so as to give rise not to seven or eight spindly laterals, but to two strong shoots. The spurs that show in I.A and II.A illustrate what

III.

VINE AFFECTED BY HAIL AND NOT SUMMER PRUNED.



A. Before Winter Pruning.



B. After Pruning.

was done; it will further be seen that the growth from the spurs was fairly satisfactory. I.B and II.B are the same vines pruned in winter. III.A and B show a hail-stricken vine that had not been pruned in summer; the growth, it will be seen, is weak and straggly.

It should not be inferred from the above that all hail-stricken vines should be pruned back in summer. Such a practice is, however, advisable whenever leaves and fruit are stripped off fairly early in the season. It at least ensures the development of good wood for the following season without affecting the crop, as there will generally be no fruit left.

WINE AND CELLAR NOTES.

By Arthur J. Perkins, Government Viticulturist.

Many of the vineyards that were planted in the early nineties are coming into bearing, and it is now possible to form some idea of the type of wine they are likely to yield. I had occasion during the past month to look through the cellars of the Clare, Watervale, and Auburn districts. Through the courtesy of the owners I was able to sample and form an estimate of the different wines made. I have no hesitation in stating that, as a whole, they are very creditable to the district; and I very much doubt whether in any part of South Australia it would be possible to surpass them. The '99 reds are particularly fine, most of the cellars having made them somewhat lighter than usual. I think that, perhaps, the most noticeable feature about the wines of these districts is their beauty and intensity of color; they are mostly characterised by a most perfect purple that it would be difficult to match. The wines are mostly dry and well made, and generally in good condition. It cannot be denied, however, that it will be easier in these districts to make a full and valuable blending wine than an ordinary table wine. I am persuaded that to the London blending trade they will prove invaluable; the same may be said for sale as a rather full table wine.

The cellars are all kept clean, and in very good order—in many respects an example to some of the older districts. From all points of view these districts promise to make good the early and favorable anticipations that were formed in their favor.

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Towards the middle of this month should begin the general racking of all wines in the cellar. As the temperature rises it is important that all wines should be removed from their lees, and stored in clean casks. For the '99 it will be the second racking; for older wines generally the only one they need receive during the course of the year. In racking, avoid as much as possible contact with air, and pay particular attention to the cleaning and rinsing of the casks. This racking will generally coincide with the bursting of the buds of the vines.

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In some cases wines that remained rather sweet after fermentation may start off again with the arrival of spring. Unless it is desired to maintain a certain amount of sweetness in these wines, fermentation may be allowed to take its course, the bungs being slightly eased off to allow of the escape of the gas. Such casks, however, require careful watching, and should be racked off again as soon as the wine reverts to stillness.

MANURING OF POTATOES.

By W. L. Summers, Inspector of Fertilisers.

Considerable interest is being taken by growers in the question of manuring of potato crops, and a few notes on results obtained in other countries may help those carrying out experiments in this direction.

In our issue of August, 1898, the results of some experiments conducted under the direction of the New York Agricultural Experiment Station officers were given, and suggestions made for experiments with manures containing the same ingredients as the formula which gave best results in the experiments mentioned.

Several residents of Mount Compass adopted the suggestions as to quantities of manures to apply and had very satisfactory returns, Mr. Sweetman getting 12 tons and Mr. Jacobs 8½ tons of potatoes per acre. Experiments in other localities have been carried out with manures supplied by Mr. F. H. Snow, on behalf of the German Potash Works and the German-Austrian Thomas Phosphate Union, the results of which are given elsewhere.

In the experiments carried out in New York in 1897 two formulæ were tested, one being based on the constituents of the potato, the other being one largely adopted by the Long Island farmers' clubs. The most favorable returns were obtained from the latter, and the most profitable results from the use of 1,000lbs. of manure per acre. Increasing the quantity of manure increased the returns, but not to a profitable extent. In 1898 the experiments were continued. The superiority of the Long Island formula was again shown, but not to the same extent as in the previous year, while the most profitable results were obtained from the application of 1,500lbs. of fertiliser per acre.

The following is a summary of the average of results from the two experiments:—

Amount of Fertiliser Per Acre.	1897.		1898.	
	Potato Formula.	Long Island Formula.	Potato Formula.	Long Island Formula.
	Bushels.	Bushels.	Bushels.	Bushels.
500lbs	125·5	163·8	138·0	143·5
1,000lbs.	166·2	184·7	167·7	168·4
1,500lbs.	166·8	189·5	188·2	196·2
2,000lbs.	178·4	190·4	191·7	202·6

Not Fertilised– 1897, 113·1bush.; 1898, 107·4bush.

The experiments have been conducted on a number of farms on plots of one-eighth of an acre in extent, and the returns averaged. The difference in the two formulæ is as follows:—

Long Island Formula—	*Potato Formula*—
4 per cent. nitrogen	7 per cent. nitrogen
8 per cent. available phosphoric acid	4 per cent. available phosphoric acid
10 per cent. potash.	10 per cent. potash.

In both cases potash formed the highest percentage, but further experiments carried out to test the effect of potash had a rather unexpected result, the returns obtained from plots receiving only nitrogen and phosphoric acid being quite equal to those where potash in addition was given. Too much reliance cannot of course be placed on these results, as they constitute a single season's work; but they should be tested by the growers themselves, as very much will doubtless depend upon the individual soils.

At the Georgia Experiment Station tests with fertilisers have also been carried out in a systematic manner, the most profitable returns being obtained from the application of 1,000lbs. of a fertiliser containing 3·8 per cent. nitrogen. 8 per cent. phosphoric acid, and 7·5 per cent. potash. Beauty of Hebron potatoes were used, the return being 116·8bush. per acre, against 40·9bush. from unfertilised plots. This formula really only differs from the Long Island formula in respect to potash, and it is worthy of note that in the Georgia experiments any excess of potash above 75lbs. per acre was useless, if not actually injurious. The addition of quantities of nitrate of soda as surface dressings increased the returns to 135·2bush. where 500lbs. nitrate were applied, but the increase was not successful from an economic standpoint. The trials bear out the experience of previous years, that in their soils the formula given above was the most profitable to use.

Professor Voorhees, in his work on "Fertilisers," states that in the best potato sections of New Jersey the applications range from 1,000lbs. to 2,000lbs. per acre, the majority of growers using the lesser quantity, containing 3 per. cent. to 4 per cent. nitrogen, 6 per cent. to 8 per cent. phosphoric acid, and 8 per cent. to 10 per cent. potash, although with late crops less nitrogen is needed. This again is almost identical with the Long Island formula.

In a bulletin on manures, issued by Mr. A. N. Pearson, chemist to the Victorian Department of Agriculture, particulars are given of a series of experiments conducted at Gippsland by Mr. Thomas Whelan. In this case the unmanured plots averaged 3 tons 9cwts. per acre, while the plot manured with 2cwts. nitrate of soda, 4½cwts. super., and 1cwt. muriate of potash yielded 7 tons per acre. Plots without potash gave nearly as good returns as those with, agreeing to a marked extent with the New York trials. The best returns were obtained from the application of 850lbs. per acre of a fertiliser containing, approximately, 4 per cent. nitrogen, 10 per cent. phosphoric acid, and 7 per cent. potash.

The question of what are the best of the respective classes of fertilisers to use is one that will depend largely on local climatic and soil conditions and market prices of the various fertilisers. In regard to potash, sulphate is generally recommended in preference to muriate, owing to alleged deleterious effect of the latter on the tubers; but where experiments have been carried out to test this influence the results have almost invariably been inconclusive, though it is stated by Professor Voorhees that when the sulphate is used the potatoes are cleaner and more uniform in size. There is no difference in the effect as to yield. If wood ashes are obtainable close at hand they might be used instead of either, but owing to the large quantity required and difficulty of distribution it is rarely they can be used. In soils inclined to be sour they would have a beneficial effect apart from the potash they contain, as they have a sweetening influence on the soil. If kainit is used it must be applied a considerable time beforehand. The objections to this form of potassic fertiliser are:—(1) High percentage of chlorine (common salt), up to 33 per cent.; (2) low percentage potash, viz., about 12 per cent.; making it bulky and costly to handle compared with the more concentrated forms.

With the nitrogen a portion at least should be in the form of nitrate or ammonia; in fact, under local conditions sulphate of ammonia or nitrate of soda are about the only forms in which it can be profitably applied direct to the crop. According to results of the Highland Society's (Scotland) experiments the nitrogen is best applied in the form of nitrate of soda, though sulphate of ammonia has a good effect, especially in wet seasons. In this colony nitrate of soda is generally a little higher in price than sulphate of ammonia, while it contains nitrogen equal to 19 per cent. ammonia, whereas the sulphate contains

23 per cent. to 25 per cent. ammonia. If, therefore, the results are approximately the same the latter will be the cheaper fertiliser.

With phosphoric acid the soil and climate will largely govern the form in which it is to be applied. The principal sources will be superphosphate, bonedust, Thomas phosphate, and guano. The former will probably give the best results on the light soils, while on the moister and heavier soils Thomas phosphate or guano may give better returns. The Thomas phosphate should be specially valuable for peaty soils inclined to sourness, as about 45 per cent. of this fertiliser consists of lime, which will tend to correct this trouble. The approximate unit price at which the phosphoric acid can be obtained is in Kangaroo Brand guano, 2s. 5d.; in high-grade bonedust (allowing for ammonia at 10s. per unit), at 2s. 7d.; in Thomas phosphate at 3s. 9d.; and in superphosphate at 5s. 9d. With the exception of supers. it will probably be best to apply the phosphates to the land at least a month before the crop is put in.

Experiments with fertilisers should be carried out on plots of about one-tenth of an acre in extent, with check plots unmanured on each side of the manured plots, or if a large number of experiments are carried out, here and there in the series; test plots without potash or with reduced amounts should be tried to ascertain whether there is already sufficient potash in the soil. This will also apply to the other constituents. The question of best means of applying the nitrogen, *i.e.*, placing it all in the soil at or before planting, using it as a top dressing, or applying part each way, can be also made. To secure uniformity the land used for the purpose should have been cropped and treated alike for at least a year previously; otherwise the after-effects of previous treatment may affect the plots differently. In the following tables is shown approximately how the various formulæ mentioned in this article can be applied to plots of one-tenth of an acre, at the rate of 1,000lbs. per acre, where superphosphate is used. The actual weights will, of course, vary according to the fertiliser used, the object being to show how the fertilising ingredients can be applied by means of the different fertilisers in the market:—

GEORGIA FORMULA.

Phosphoric acid, 8lbs.: Contained in 60lbs. super., costing 2s. 6d.; or in 45lbs. Thomas phosphate, costing 1s. 5d.; or in 40lbs. high-grade bonedust, costing 1s. (after allowing full value for ammonia); or in 40lbs. Kangaroo brand guano, costing 11d.

Nitrogen, 3·8lbs.: Contained in 18lbs. sulphate ammonia, costing 1s. 9d.; or in 23lbs. nitrate of soda, costing 2s 3d

Potash, 7½lbs.: Contained in 15lbs. sulphate of potash, costing 2s. 5d.; or in 12lbs. muriate of potash, costing 1s. 6d.; or in 62lbs. kainit, costing 2s. 6d.

LONG ISLAND FORMULA.

Phosphoric acid, 8lbs.: Contained in 60lbs. super., costing 2s. 6d; or in 45lbs. Thomas phosphate, costing 1s. 5d.; or in 40lbs. high-grade bonedust, costing 1s.; or in 40lbs. Kangaroo brand guano, costing 11d.

Nitrogen, 4lbs.: Contained in 20lbs. sulphate ammonia, costing 1s. 10d.; or in 25lbs. nitrate of soda, costing 2s. 5d.

Potash, 10lbs.: Contained in 20lbs. sulphate of potash, costing 3s. 2d.; or in 16lbs. muriate of potash, costing 1s. 11d.; or in 84lbs. kainit, costing 3s. 4d.

The formula given by Professor Voorhees varies between this and Georgia formula, while the treatment found successful by Mr. Whelan works out as follows:—

Phosphoric acid, 8lbs.; Contained in 60lbs. super., costing 2s. 6d.; or in 45lbs. Thomas phosphate, costing 1s. 5d.; or in 40lbs. bonedust, costing 1s.; or in 40lbs. Kangaroo brand guano, costing 11d.

Nitrogen, 3·4 lbs.: Contained in 17lbs. sulphate ammonia, costing 1s. 7d.; or in 22lbs. nitrate of soda, costing 2s. 1d.

Potash, 6lbs.: Contained in 12lbs. of sulphate of potash, costing 1s. 11d.; or 10lbs. muriate of potash, costing 1s. 3d.; or in 50lbs. kainit, costing 2s.

In using the fertilisers it is generally recommended to apply them before sowing or in the trench after covering the potatoes lightly. As before stated, phosphates, not in a soluble form, should be applied some time beforehand. It is also advised by many that the potash should be put on the land some time prior to planting. Portion of the nitrogen may be beneficially reserved as a top dressing to be applied when the potatoes are first hoed. When bonedust or other phosphate manures containing nitrogen are used the quantity of distinctly nitrogenous fertiliser may be lessened to the extent of 1lb. for each 5lbs. or 6lbs. of bonedust used. The fertilisers mentioned should not be mixed, as one may act injuriously on others, or, at least, if used mixed should be applied at once, before any chemical changes take place. In comparing results of experiments the expense of the respective dressings must be taken into account.

In the cost the average price for the past season has been taken. It must be clearly understood that only one item from each section—phosphoric acid, nitrogen, potash—is used on each plot.

DANGERS ATTENDING THE ACCLIMATISATION OF BIRDS AND ANIMALS.

In the United States Department of Agriculture Year Book for 1898 there is an article upon the dangers of introducing what may prove pests in acclimatising birds and animals which are useful in their native habitat. A number of instances are given, amongst which the following may be instanced:—

Goats were introduced to the island of St. Helena by the Portuguese in 1513, and multiplied so fast that the country, which was at one time covered by dense forest, is to-day a comparatively barren desert. Browsing upon the young trees and shrubs, they rapidly brought about the destruction of the vegetation which protected the steep slopes. With the disappearance of the undergrowth began the washing of the soil by tropical rains and the rapid destruction of timber, with the result stated.

The introduction of *cats* on isolated islands has frequently resulted in their rapid increase and corresponding decrease of birds and other small animals. The same result is noticed, perhaps to a less extent, on the mainland, and many species of birds once quite common are now rare, if not extinct. The introduction of cats to destroy the rabbits in West Australia may possibly have a similar effect.

The Mongoose was introduced to the island of Jamaica to get rid of introduced rats, which were very destructive to cane and other crops. The animals increased very rapidly, and in ten years made a very marked diminution in the damage done by the rats. With the disappearance of the rats, the mongoose started to destroy young pigs, lambs, kittens, poultry, game, small birds, snakes, lizards, frogs, and many beneficial animals, besides eating bananas, pineapples, sweet potatoes, and other cultivated crops. By the end of the second decade the destruction was so marked that many common species had become quite rare, and as a consequence of the absence of insectivorous birds, snakes, and lizards, there was a marked increase in several injurious insects. In San Juan the experience has been somewhat similar, though here the benefit from the destruction of the rats is said to more than counterbalance the damage done. In Hawaii, however, the evil effects of the introduction of the mongoose were so marked that the introduction, breeding, or keeping of the mongoose was prohibited, and a bounty paid on all the animals destroyed.

Sparrows were first introduced to America in 1850, but did not thrive. They were again introduced in 1852 and later years at considerable expense and trouble, and, as in Australia, increased at a rapid rate, and spread over a wide area of country. The American experience with this bird has been as expensive as Australian, and attempts to check its spread have been equally unsuccessful in both continents.

Of rabbits, Australian experience has been very bitter. Starlings and other introduced birds, both here and elsewhere, have increased beyond expectations, and have developed new traits which make them serious nuisances rather than benefactors, as the introducers expected.

The writer of the article states in his conclusion that "notwithstanding the object lessons afforded by the English sparrow in our own country, the rabbit in Australia (and he might well have added the sparrow also), and the mongoose in Jamaica, no steps have been taken to prevent the repetition of similar costly mistakes in the future, and at present no restriction is placed on the indiscriminate importation of exotic species into the United States. . . . . . The introduction of exotic birds and mammals should be restricted by law, and should be under the control of the United States Department of Agriculture." With the sentiments of the writer all sensible people will agree. They apply with equal force to Australia.

Both in America and Australia very encouraging reports have been published during the past year concerning the value of the bird known in Germany as kohlmeise, and in Great Britain as the giant titmouse. It was positively asserted that this bird was very fond of caterpillars, especially those of the codlin moth, and in consequence it was suggested in some quarters that the bird should be introduced to South Australia. Careful inquiry elicits the fact that this bird does an immense amount of damage to fruit in Great Britain, and it also destroys the smaller birds, while there is no proof that it ever feeds upon codlin moth caterpillar.

PEANUT CULTIVATION.

There are two varieties of Arachis hypogœa, or "peanut," in cultivation—the "running" and the "bunch." The running sort is the most generally grown, because it is the more productive; but the bunch variety is more easily cultivated and cured.

Where peanuts are grown extensively there are factories supplied with patented machinery for stripping and polishing the peanuts; but where cultivated on a small scale the pods are simply removed from the vines, and are roasted by dealers for sale in small parcels.

The nuts contains about 45 per cent. of a sweet palatable oil when it is fresh. The yield runs from 40bush. to 120bush. per acre on soils that are suitable in climates which are favorable. A bushel of peanuts weighs from 25lbs. to 32lbs. unshelled. In the Northern Territory Mr. M. Holtze (now Director of Adelaide Botanic Garden) obtained 27cwts. from an acre. The plant is annual, and the haulm, or hay, is highly nutritious for cows and other live stock. Calcareous, light soils are very suitable, especially if there is a rather firm subsoil at 6in. depth.

About 11,000 tons of peanuts are grown annually in America, and India exports about 60,000 tons annually. The plant is indigenous in Peru and Brazil, West Indies, and West Africa.

This plant is peculiar in its habit of elongating the peduncle or stalk on which its seeds are produced until its point reaches the soil, which it enters, and then the seed-pod enlarges and produces generally two large seeds about the size of a Yorkshire Hero pea. If by any means the peduncle fails to reach and enter the soil, it dies and fails to produce seeds; hence the necessity for the light, loose soil, with a hard subsoil to prevent the pods being buried too deeply to allow of them being pulled up along with the rest of the plant; hence also for the necessity to avoid too deeply ploughing in the first preparation of the land.

A grey loamy soil is probably the best for peanuts, as the darker soils, especially red iron-stained, are likely to stain the pods. Clean bright pods bring the best prices. If the soil is not calcareous, lime must be supplied at the rate of 50bush. per acre. Without lime the seeds will not be formed, although the pods may be large, as any soil will produce vines and pods. Peanuts do best when following a crop that has been hoed regularly, such as maize, sorghum, &c.

Ploughing should be early, and very shallow, not over 4in. deep. The plant takes five months from sowing until the crop is ripe. Frost is fatal to the curing, but this is not much to be feared in South Australia. The seed should, however, be sown directly all chance of frost is over. The lime should be spread after ploughing and before harrowing. Then run out shallow furrows 3ft. apart. A good heavy dressing with a potash fertiliser combined with a moderate quantity of phosphoric acid will be greatly beneficial to the crop, but nitrogen will not be so much needed, because the plant belongs to the Leguminosæ, and finds most of its own nitrogen. The fertiliser should be strewn in the furrows—say 150lbs superphosphate and 50lbs. muriate of potash per acre.

Ridge up the furrows then flatten them to within 2in. or 3in. of the general level. Drop beans about 2ft. apart, three in each place if shelled. If in the pods at least six pods should be dropped at each spot, because, where sold for seed, many of the pods are quite empty. It is best to shell the beans and select only the bright solid seeds, as the others will not germinate. The greatest depth to which they should be covered must not exceed 2in. In ten to fourteen days the plants will begin to show. If any spot shows less than two transplant from the excess in other places. After this the ground must be kept continuously cultivated, free, mellow, and clear of all weeds. When the plants begin to blossom spread the vines out and throw a little soil on the centre of the plants. The peduncles will then find their way into the loose soil and the pods will form beneath the soil. A fair crop is 50bush. The standard weight is 28lbs. per bushel. When the crop is ripe it should be harvested only during clear, bright, sunshiny weather. The soil is to be loosened first at each "hill" with a pronged fork; then the vines are pulled up by the tap-root, drawing at the same time all the beans or nuts from the loose soil attached by the peduncles or stalks to the branches. No beans are produced on the roots. The plants are then turned root upwards on the hill and left to dry. As soon as dry they must be stacked for curing. For this purpose stakes about 8ft. high are firmly fixed in the ground and brush placed around the base to keep the vines clear of the soil. The dried vines are now folded together with the nuts pendant and placed around the stake, the nuts in the centre, making a stack 2ft. in diameter and continued to the top of the stake, which should be covered at top with straw to shed rain. Here they should remain until thoroughly cured. Frost will injure the nuts; therefore the crop should be brought off the field before night frosts come on.

MANGOLDS AND SUGAR BEETS.—On very many farms mangolds and other forms of beets can be grown with great advantage for pigs, poultry, and cattle. Where the soil is not deep it may be best to grow sugar and other beets and the Globe mangolds, but on deep soils the Mammoth and Long Red mangolds will give the heaviest returns. Of course, the richer and better the soils the better the chance of securing a very heavy yield, but as much as 60 tons of Long Red mangolds per acre have been grown on the apparently poor shelly sand soils near Millicent in the South-East. It is probable, however, that the soil is much richer than it looks. Sugar and Silesian beets are specially good for cows.

PRODUCE EXPORT DEPARTMENT.

Every effort is now being made to get the alterations and additions to the depôt completed in time for the approaching lamb season, which will probably commence in August. The depôt will be in a position to treat 9,000 lambs weekly, and store up to 30,000 carcasses.

Should farmers intend shipping lambs or other produce early notice will be necessary, so that freezing space can be secured.

The department will advance to one penny halfpenny (1½d.) per pound on lamb, and return the value of fat and skins. This will be an immediate return of from 6s. to 7s. per lamb.

It will be of interest to give the average net price realised last season by those who shipped on their own account instead of selling here to merchants :—Five thousand three hundred and three lambs were shipped on owners' accounts by the department and one private firm, and the average net price was 10s. These were sent to the depôt in the wool, and varied widely in weight, quality, and price—from 28lbs. to 48lbs. in weight, from inferior to prime in quality, from 7s. 1d. to 13s. 5d. in price. There were also 1884 lambs sent to the depôt shorn; net average price, 9s. 4d. This is somewhat better than the price obtained for the woolly, as the shorn lambs generally reached London at the end of the season, when prices were higher. Considering that a "demand had to be created and low prices accepted" the returns must be considered as eminently satisfactory, remembering that all classes and breeds were shipped. The results justify the expectation of even better prices next season if good quality only is sent, and it is reasonable to assume that the breeds best suited for the export trade will receive the careful attention of growers in the future, because the future of the trade and the possibility of levelling up to New Zealand prices will depend on due attention being paid to breed and shape.

The following are the charges:—Lamb and mutton, three-halfpence (1½d.) per pound. This includes slaughtering, dressing, weighing, bagging, freezing, putting on board vessels at the depôt, freight, insurance (covering all usual risks), and London charges.

The depôt has treated during July 7,191 crates, containing 55,208 rabbits. The *Wakool*, which sailed on the 16th, took 9,084 crates, containing 103,578 rabbits, for London. There are now 3,428 crates, containing 83,756 rabbits, in the depôt awaiting shipment.

By the same boat the department forwarded to London as a trial shipment forty-five kangaroo haunches and forty-eight tails on behalf of a client at Leigh's Creek. Should the sales prove satisfactory there is every probability of a trade being established in these and wallabies' tails and haunches, as the department is receiving already inquiries as to the prospects.

A small parcel of seventeen chickens and fourteen turkeys also went forward in the *Wakool.*

The season's first shipments of butter, consisting of 13 tons, were forwarded per *Oruba* and *Ormuz* on behalf of private firms.

The space offered by the mail companies for the carriage of oranges has been availed of to the extent of sixty-eight cases per *Oruba*, which sailed on the 13th July, and there will probably be two more shipments of from 100 to 150 each during August.

The only wine shipment for the month through the depôt is the *Ormuz*, which has taken 4,980galls. forward to the London depôt.

The London Wine and Produce Depôt has rendered the following account sales during the month:—Wine—6,274galls. claret, at 2s. 9d.; 299galls. port, at 4s. Poultry—92 ducklings, at 2s. 6d.

REGULATIONS UNDER THE VINE, FRUIT, AND VEGETABLE PROTECTION ACT.

The following Regulations under the Vine, Fruit, and Vegetable Protection Act were gazetted on June 29, and are published for general information :—

Regulations relating to the Introduction of Trees, Plants, and Fruits into South Australia.

1. In these regulations the following words in inverted commas shall have the meanings set against them respectively, that is to say: —

"Minister" shall mean the Minister of Education and Agriculture or the Minister for the time being controlling the Department of Education and Agriculture.

"Inspector" shall mean an inspector appointed under "The Vine, Fruit, and Vegetable Protection Act, 1885."

"Disease" and "insect" shall have the meanings respectively assigned to them by section 3 of the said Act.

2. (*a*) The introduction into South Australia of grape vines and any portions thereof, from any country or place, is absolutely prohibited.

(*b*) Fruit trees and portions thereof (not being grape vines or portions thereof) may be introduced into South Australia from any country or place by the Minister, or by any inspector authorised by him, but not otherwise.

(*c*) Living trees, plants, or portions thereof (not being grape vines, fruit trees, or portions thereof), and fruits (not being grapes) may be introduced into South Australia from any country or place under and subject to these regulations, but not otherwise.

(*d*) Living trees, plants, and portions thereof (not being fruit) shall (unless sent by post) only be introduced into South Australia at Port Adelaide.

3. All living trees or plants, or portions thereof, or fruits introduced into South Australia from any country or place shall, on being landed or introduced, be forthwith delivered into the custody of some officer of Customs, and shall, at the expense of the importer or consignee thereof, be conveyed in original unopened packages to such place as the Minister shall direct.

4. An inspector shall examine such trees, plants, or portions thereof, or fruits, and may treat such trees, plants, or portions thereof, or fruits, in such manner as he may think desirable, or may order that such trees or plants, or portions thereof, or fruits, and the boxes or packages in which they were packed, or either of them, shall be destroyed by fire if, in his opinion, there is any danger in importing them.

5. Living trees, plants, portions thereof, or fruits, and packages containing trees, plants, portions thereof, or fruits, imported into South Australia from the colonies of New South Wales, Victoria, or Tasmania, if accompanied by a certificate from a Government inspector that they have undergone fumigation with hydrocyanic acid gas or other effective disinfectant for one hour, may, after inspection, be delivered without further treatment if the inspector considers further treatment unnecessary.

6. The expense of conveying such trees, plants, portions thereof, or fruits, to the place fixed for their examination, and of the examination and treatment thereof, shall be borne by the consignee or introducer thereof, and shall be paid before they are delivered to such consignee or introducer.

7. No person shall be entitled to any compensation by reason of the destruction of any tree, plant, portion thereof, or fruits, or of any box or package under these regulations.

Regulation for preventing the Spread of Insects and Diseases.

8. No person shall keep or sell, or expose or offer for sale, or in any manner cause the distribution of any living insect of the kind prohibited in any stage of its existence, or any tree, plant, or fruit infested with or affected by any insect or disease.

Penalties.

9. Any person guilty of any breach of the above regulations is liable to a penalty of not less than five pounds nor more than one hundred pounds, or to be imprisoned for any period not exceeding six months.

WHAT POTATOES REMOVE FROM THE SOIL.—It may be of interest to farmers generally to know what quantities of fertilisers a potato crop takes from the land. In a recent report made by Mr. Aimie Girard to the Italian National Society of Agriculture it is stated that a crop of 6 tons of potatoes per acre takes from the soil its chief fertilising matters in the following quantities :—Nitrogen, 96lbs.; phosphorus, 22lbs.; potash, 170lbs.

POULTRY NOTES.

By D. F. Laurie.

Poultry Diseases.

It must always be a matter of regret that so little knowledge of hygiene is to be found among poultry breeders. Nearly every mail brings me a letter or letters from readers of this *Journal* asking for remedies, &c., for various simple diseases; simple as regards cause, but deadly in effect. Nearly all these diseases might be guarded against by a little attention. The insanitary conditions under which a great many birds are compelled to exist are both disastrous to them and also a distinct menace in many cases to human beings. Roup is very prevalent, and is in many cases associated with the dreaded scourge diphtheria. It has been abundantly proven that this fell malady is intercommunicable between human beings and poultry. We hear a lot about sanitation and inspectors, yet never a word about the hundreds of diseased poultry and reeking poultry houses. One writer goes so far as to say that people who display such criminal negligence should be debarred from keeping poultry. He wrote not only on behalf of poultry breeders who war against disease, but also in the interests of humanity. Not only is carelessness in housing and general sanitation answerable for much disease, but also injudicious feeding and the use of so-called egg foods, poultry spices, and similar deleterious much-advertised nostrums.

The aim of all competent authorities is to educate breeders to avoid the errors of the past, and to adopt rational, scientific methods. Unfortunately too many of the old-time, worthy, but woefully ignorant fanciers make their faddist notions heard; these are the hardest to battle against; they lack power to think, and reason, and are incapable of being convinced. Those who wish to make poultry pay must first of all procure healthy stock to breed from; then they must feed on sound food, and rear their stock so as to become healthy adults. Cleanliness must be the ruling motive in all operations; filth breeds disease, to be followed by loss and disappointment. Birds that are bred from parents which were fed on forcing and stimulating food invariably lack stamina and constitution; further than this, the parents in the majority of cases suffer from disorganisation of the digestive organs and affection of the liver, which they transmit in a more marked degree to their progeny. In purchasing poultry, and before a bargain is concluded, it is an excellent plan to make guarded inquiries of the seller as to his method of feeding; if you hear of too much hot soft food, pepper, spices, maize, and general codling, such birds are not worth buying. I am a firm believer in breed, and fully recognise the value of show-points, and the great good properly-conducted poultry shows are doing, but it is my intention to wage uncompromising warfare against the follies in feeding and breeding that are so prevalent. A bird can be turned out just as fit for high competition when rationally treated and fed, as when pampered and fed on improper foods.

Several correspondents are asking for a cure for roup. This is a preventable disease, which is to be hoped will not occur again in the yards of readers of this issue. Roup is a name given by poultry breeders and others to a group of diseases which have many symptoms in common; as far as I know there has never been a scientific investigation, and probably, as each outbreak is marked by special symptoms, a very long and carefully conducted series of experiments would be necessary. It is sufficient to say that we know the principal causes, can as a rule diagnose cases, and cure them. Under these circumstances the question of its analogy in any form to human maladies may be laid aside, with this caution that no diseased bird or animal is a healthy companion for human beings, nor should disinfection be disregarded. In all cases of disease isolation of the affected bird is imperative. Nearly all poultry diseases, properly so called, are infectious or contagious. It has been remarked that diphtheria is not uncommon among poultry, and cases are easily recognised as in human beings; the symptoms varying, and *post mortem* examinations disclosing various modifications, from slight spots to trachea and lungs completely invaded with malignant growths.

Diphtheria is very frequently associated with roup, often when the latter is in a simple form. Such outbreaks are certainly to be accounted for by lack of sanitation, overcrowding either past or present. In its worst form diphtheritic roup makes its appearance after the first rains in autumn. Without being in a position to give accurate statistics, I can say that these outbreaks are rarely seen after a hot, dry summer, but, as a rule, after a mild one. They do not necessarily occur in yards which at one time contained numerous affected birds, but also in yards previously not infected. From this we may presume that the microbes, bacilli, or what not, may be blown from place to place by the summer winds, to germinate and propagate when conditions are favorable. It will now be seen why so much stress is laid upon the fact of so many neglected yards, which in time become centres of infection. A proper cleaning out, the application of lime and disinfectants to yards, &c., occupied by diseased birds will prevent the extension of the disease. For greater convenience we will divide roup into two classes, simple and complicated. Simple roup, like its more disastrous fellow, is caused by insanitary conditions, and may also result from neglected colds, pneumonia, &c. It is generally known by a glairy discharge from eyes, nostrils, and throat, which if not attended to becomes thick and very offensive. Isolation is the first step. Place the bird in a warm, sheltered coop, well open to the sun, unless the weather is hot. The food must be light, given little and not too often, and the drinking water should contain sulphate of iron. Mode—dissolve 2ozs. of sulphate of iron in a pint of boiling water; to each quart of drinking water add two tablespoonfuls of the mixture. Use an earthenware drinking vessel, not a metal one. Sulphate of iron (copperas) is inexpensive.

Fumigating with carbolic acid or eucalyptus has proved very effective, and can be performed on a number of fowls simultaneously in a large case or a well-closed fowl house. Single birds may be treated in a special fumigator, provided with a false bottom 6in. or 7in. from the ground, formed of wire-netting or bars for the birds to stand upon. The fumes rise from below and are supplied either by a lamp heating a strong solution of acid (or eucalyptus oil) and water, or by pouring a little of the pure article on a hot piece of iron. It is necessary to watch the birds during the quarter of an hour which the operation lasts, in case of symptoms of asphixiation through too strong fumes. The following paste has proved very successful and is much used in Victoria:—½oz. liquorice powder, ½oz. ground ginger, ¼oz. cayenne, ¼oz. pimento, 1oz. Epsom salts, 1oz. confection of senna, add enough treacle to make a stiff paste. Dose —a piece the size of a bean twice a day.

Another good remedy prescribed by Mr. Vale, an English specialist, is as follows:—Hydrastin, 2grs.; ferri sulph. (dried), 3grs.; sulph. of copper, 3grs.; powdered cayenne, 12grs.; oil of copaiba, 24 drops; and of Venetian turpentine and powdered magnesia, sufficient to make twenty-four pills. Dose —one twice a day.

As regards the more virulent forms of the disease, for instance, where complications occur, the best advice to offer is to destroy and burn. We have on many occasions had an epidemic, causing the loss of thousands of birds; unfortunately the variation of symptoms is so considerable that any definite treatment proposed has had little occasion for proof.

ORCHARD NOTES FOR AUGUST.

By George Quinn, Inspector of Fruit.

The extremely dry weather which has prevailed over a large portion of the fruit-growing areas of the colony for some weeks past has aroused anxiety respecting the quantity of moisture which is likely to reach and be retained in the subsoil for the use of the trees during the coming summer. I wish to strongly urge upon all those owners of orchards on the dry plains the advisableness of utilising all of the water which may, during the remainder of this winter, flow along drains, small creeks, &c., in or near their properties, for the purpose of giving the ground a good soaking. For all deciduous fruits and vines there is no form of irrigation likely to produce fruits of such fine quality as that applied near the end of winter, while the buds are yet dormant. If the soil and subsoil can be soaked, and, by means of the cultivator, covered with a mulch of finely pulverised soil, the hot spring sunshine will draw upon the stored-up supply in proportion to the transpiration from the foliage, the unavoidable checks received through delays in surface irrigation are avoided, and the roots are not encouraged by this method to come up into the surface soil, where they are more subject to sudden droughts.

Those orchardists who intend giving a second ploughing should begin during August, and throw the soil back to the stems of the trees with a shallow furrow. In early districts it may be advisable to set the cultivator going upon the soil at once to break up the lumps before they are baked too hard. Should any grower have been experimenting with green manuring—growing leguminous plants between the trees—they may be turned in about the end of the month if sufficiently advanced.

Members of the pea family are usually ploughed under when pretty well out in full bloom.

The pruning of deciduous trees should be completed during this month. On the plains it should be all finished early in the month.

Pears, apples, and peaches can usually be left until the beginning of August. In dealing with those varieties of peaches which shed vast quantities of buds it is most advisable to delay the pruning till this period, so as to form a fair estimate of the probable crop of blooms available for fruitage next season.

The grafting of deciduous trees will begin towards the end of the month. Root-grafting, to form blight-proof apple trees will be well under way. This work is best done indoors at a bench. Want of space has crowded out an illustrated article dealing exhaustively with this practice, but it will be included next month.

About the latter end of August—unless the season turns unusually wet and cold— will be a good time to transplant citrus trees. The growth which starts in spring is foretold sufficiently long beforehand by the swelling of the axillary buds to enable the trees to be shifted in time for this growth to be made when they are placed in their permanent positions. This is preferable to permitting young shoots to emerge, which will undoubtedly wither off, if, as almost invariably happens, the root system be much reduced in the operation of lifting them.

The pruning of old citrus trees could be undertaken now. All old dead wood should be removed, and dense crossing twigs and limbs cut out. Any water-shoots should be cleaned out completely from old trees, but on younger ones sometimes the tree may be balanced by retaining some of these shoots. Procumbent branches lying on the soil should be lightened, so as to permit them standing clear and bearing their own weights.

Complaints of the early appearance of peach aphides are to hand. In dealing with this pest the rapid breeding habits must be considered, and any spraying to be effectual must not only be thorough, but must be repeated at fairly short intervals, say thirty-six hours, where the attack is severe. I have found the proportion of 2ozs. very strong tobacco and 3ozs common soap to each gallon of water an excellent and effectual wash. It is prepared by boiling the tobacco and soap in a small quantity of water and diluting with more water to the required volume.

The opening of the outer coverings of the buds is the signal for spraying with Bordeaux mixture. This is used upon peach and nectarine to prevent "curl-leaf fungus," on apricot for the suppression of the shothole of the leaf and the scab-like pustules on the fruits, and upon apples and pears to kill winter spores of the so-called "scabs" or black spot." This spray is also a good destroyer of mosses and lichens, which are injurious to the bark of many fruit trees.

There are many formulæ for the preparation of Bordeaux mixture. A simple one to remember and effectual to use, is made of 5lbs. bluestone, 5lbs. fresh lime, and 25galls. of water. This is used before the leaves are developed. When the leaves and fruits are upon the tree the water should be increased to 50galls.

The scraping of the stems of trees to kill larvæ of codlin moth, and take away the refuge of future generations of that pest, should be prosecuted vigorously now. This applies to pear, apple, and quince trees chiefly, but any other kinds, or vines growing close by, should receive attention in this way, as the caterpillars harbor about the stems of these as well. No old bandages should be allowed to remain on the stems of the trees in winter.

NOTES ON VEGETABLE-GROWING FOR AUGUST.

By George Quinn.

Besides destroying weeds the frequent stirring of the soil with hoe and fork facilitates the growth of all vegetables at this time of the year.

With the exception of leguminous crops, such as peas and beans, a light dressing of sulphate of ammonia or nitrate of soda spread along between the rows and forked or hoed in will greatly benefit all crops. Superphosphate is also a good manure to apply in this manner now, and it may be given to all kinds of vegetables.

Sowings of peas, carrots, parsnips, red and silver beets, lettuce, cresses, onions, and broad beans will be made now.

The planting of the second crop of potatoes will be carried out now. Well started setts should be used, but the "eyes" should not be allowed to grow too long before being planted, as much delay will result where they are broken off in handling.

These revel in any amount of manure. Good rich stable dung and bone dust are good manures for potatoes. The former should be worked into the soil and the latter sown into the furrows above the thinly covered setts.

Asparagus and rhubarb beds may yet be planted safely.

In last month's issue information respecting the preparation of soil for these plants and how to plant were given, and inadvertently an omission of the area to be manured by certain quantities was perpetrated. It should read half a dray load to each rod of ground.

Make the usual successional sowings of salad plants, and sowings of tomatoes should be made in hot manure frames, as advocated in last month's notes. Formerly sown tomatoes may be ready to be pricked off into pots or ordinary frames, to permit sturdy development prior to being set outside in the beds.

Sowings should be made of cucumbers for forcing early, and melons of various kinds could also be started in these frames. Where the ground is not in use now it is a good plan to prepare it for melons by burying all the vegetable matter available so that it may be pretty well decayed before the plants require it.

Growing crops of spinach, carrots, parsnips, radishes, &c., should be rigorously thinned if good samples of produce are hoped for.

BROOM CORN.

"Broom corn" is a name given to two or three varieties of sorghum which produce spikes or seed-bearing heads, with which brooms can be made. The spikes of rice are also used for the same purpose, but, being brittle, are not nearly so good. Some kinds of millets are also used, and these make fairly good brooms, but not as good as those made from "broom corn."

Broom corn will thrive in any place where maize will do well. The field on which it is to be grown should be of an even good character of soil, so that the crop shall all be ready at the same time and give "broom" of even color and quality. Light rich alluvium is the best for growing this crop, deeply ploughed and thoroughly well prepared. Seed should not be sown too early, because the young plant will be checked by cold and will remain more or less stunted. Some suitable localities are later than others, but somewhere about October is about the average best time for sowing. One bushel of seed is sufficient for twelve acres. If grown too thinly the plants may be too coarse and produce too long a head, and if too thickly the "broom" will be too weak. About sixty to seventy plants to the square rod will generally give the best results. Thinning out will therefore probably be necessary. At first the plants will grow slowly, but later on it will be vigorous. No good result can be gained unless the surface is kept constantly loosened to a depth of 2in. whilst the plants are growing. Weeds must be rigorously excluded. When the seeds are just ripe, and not dead ripe, the "corn" is to be "tabled." This process consists in cutting the stems half through about a foot below the head of seed, and laying it down horizontally, so that the whole of the heads support each other. After two or three days the heads are carried under shelter and the seeds are scraped off by the aid of a comb fixed on a bench. An alternative method of treatment is called "topping." Upon this the success of the crop depends to a very large extent. When the plants are just forming their seeds the heads are bent over about 6in. below where they branch. This operation does not interfere with the development of the seeds, which, as they mature and become weighty, draw the branches or "brooms" long and straight. Before the seed is quite ripe the heads are cut off where bent, and the seeds thrashed off. The comb of a stripping machine or "reaper" would do. About 20bush. of seed per acre is reckoned a fair yield. The yield of broom per acre varies from 200lbs. to 1,000lbs., and the value in the Australasian colonies is considerably higher both for "corn" and "broom" than in the United States. where the first is stated at about 1s. 2d. per bushel and the latter at 5d. per pound. Sorghum is slightly hardier than maize, or at any rate will thrive in a dryer climate.

Broom corn must not be subjected to dew or rain, and must not be dried in the sun, but by air passing through and over it whilst on hurdles or hung up to beams under a shed.

FRUIT TREE PRUNING.—No. 5.

By George Quinn, Inspector of Fruit.

The Cherry.

There is probably no other kind of fruit tree respecting the pruning of which such a diversity of opinions are heard. I think that when a series of well considered experiments have been carried out to elucidate this subject much of the damage usually attributed to pruning the cherry tree will be found to have only been indirectly caused by this practice, and that the primary fault will be found in the unsuitable conditions of climate, soil, &c.

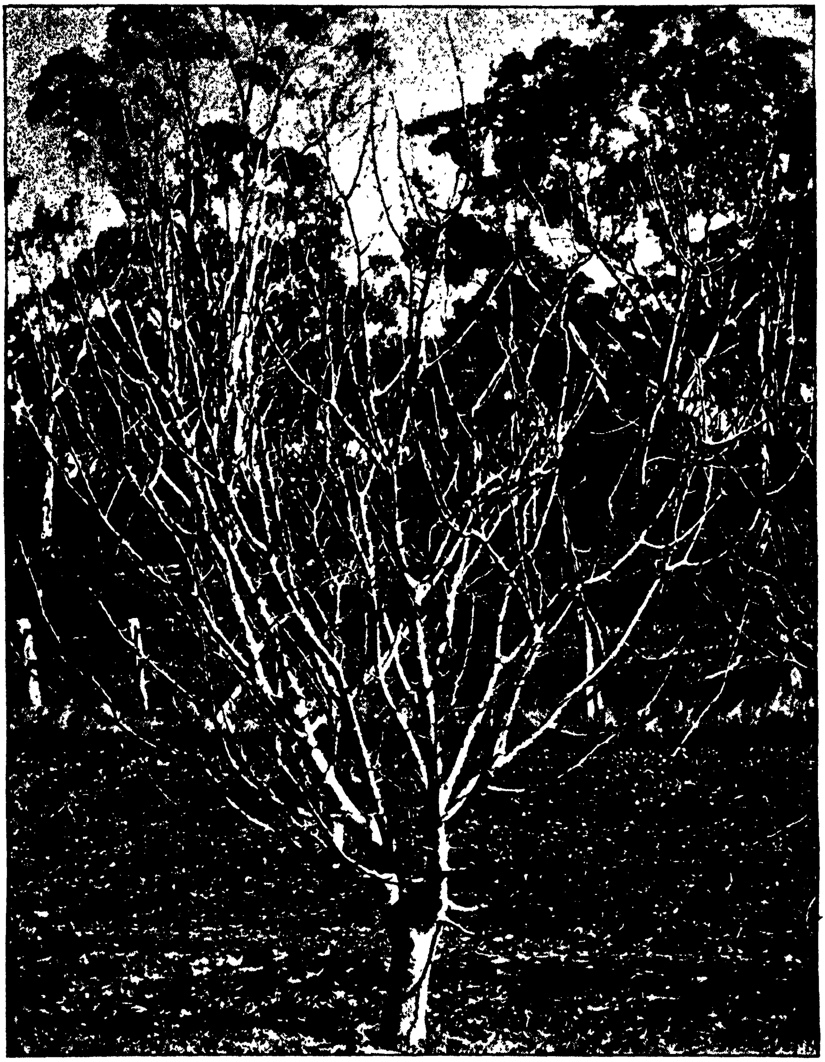

PLATE XXXIV.—TYPE OF CHERRY TREE—BLACK TARTARIAN.

In California many leading cherry-growers prune regularly each winter, and pretty heavily too. Some of our most successful local growers do likewise. Others again may cut the young trees a trifle immediately after they are set into the orchard, but that is about all. Many growers do not prune at all. It is demonstrated beyond dispute that the trees under all of these methods produce fruit in accordance with the general suitability of their environments, but

PLATE XXXV.–TYPE OF CHERRY TREE–WATERLOO.

the problem which we have to solve is—Which method is calculated to give the maximum return throughout the life of the tree? Cherry trees would doubtlessly be pruned more systematically were it not for the tendency to "gum" from the wounds, and the consensus of opinions shows that "gumming" is less prevalent when the pruning is done while the sap is still active. This is presumably owing to a more rapid healing of the wounds. Many experienced growers are emphatic respecting the advantages of applying some dressing, such as shellac dissolved in alcohol, to the wounds immediately the pruning is performed.

Mycologists have demonstrated the presence of an organism in the exuding gum which, in their opinion, aggravates its flow and thus prevents the healing of the wounds. This bacillus is stated to be transferable by pruning tools. If this be true, some antiseptic dressing is doubtless necessary in all cases. There is no record of this organism having been found within the tissues of the cherry tree, excepting when it has gained admission through some outward source; consequently with our present knowledge we must treat it as a secondary cause of the evil.

PLATE XXXVI.—TYPE OF CHERRY TREE—ST. MARGARET'S.

I have briefly touched upon this matter because of its being inseparable when the pruning of the cherry is discussed and as the majority of growers with whom I have had the privilege of conversing upon the subject agree that it arises in most cases from wounds and checks in the flow of sap. In my observations, made under varying conditions in this and the adjoining colonies, wherever cherries are grown I have invariably noticed that the disease or defect is far less injurious or frequent when the trees are planted on thoroughly well-drained soil where no stagnant water collects or permanent water rises beneath within about 15ft. of the surface. Assuming, therefore, that these trees are planted in suitable ground, and climatic conditions are congenial, I have little hesitation in saying that the cherry may be safely pruned and grown in a more profitable form than has been hitherto adopted by many growers.

In Plates XXXIV. and XXXV. two types of trees of the Black Tartarian and Waterloo varieties are shown. These are very productive, and are much more systematically trained than usual in South Australia. Of the two, XXXIV. is preferable. Its main limbs have not increased in length out of proportion with their stability. They are clad in fruit-bearing wood down to the trunk, and when the tree carries a heavy crop it does not twist or bend out of shape with the weight.

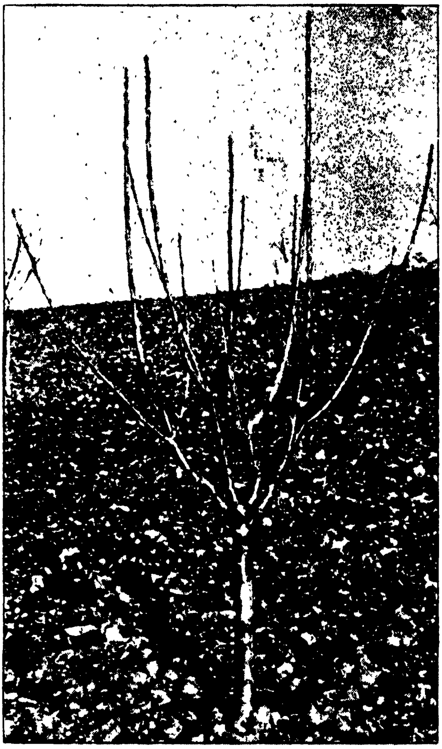

PLATE XXXVII.—WELL-SHAPED YOUNG CHERRY TREE.

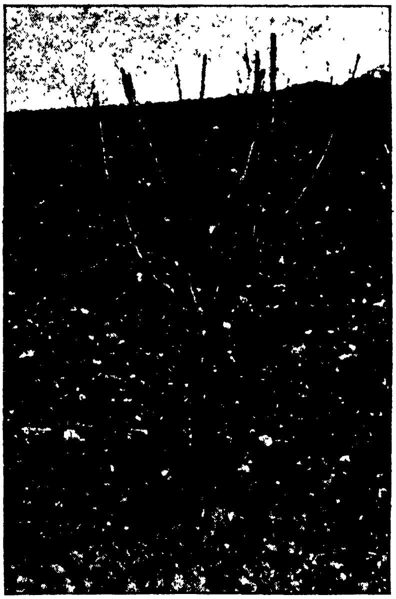

PLATE XXXVIII.—PRUNING OF TREE IN PREVIOUS PLATE.

Plates XXXV. and XXXVI. should be compared. The latter is of the late variety known as St. Margaret's. Both of these trees are ascending rapidly, and as the spurs on the lower portions of the main limbs become exhausted, and those on the upper extremities of the shoots become more fruitful, not only will inconvenience in harvesting be experienced, but the shoots will become top-heavy and bend or swing badly; and even should not outward rupture of the tissues be apparent, this twisting effect should be considered in reckoning the causes of sap checks and future outbursts of "gumming."

The tree shown in Plate XXXV. was apparently shortened when set out, and has not been pruned since. That pictured in XXXVI. was cut off when transplanted and the three well-set foundation arms shortened in during the next winter. Note their stability. Since then the main arms have grown without check, and a glance will show how disproportionate are their respective lengths and girths. In the upper shoots a number of crotches—several shoots emerging from the same level around a branch—are seen. These are always a source of weakness in a tree if the shoots become heavily laden.

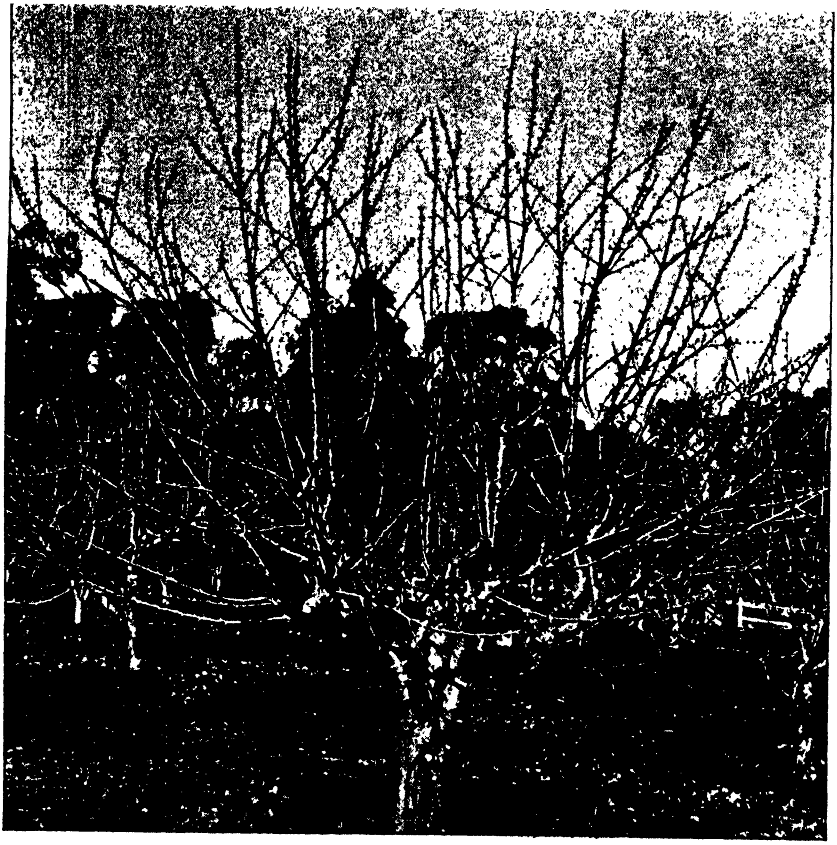

PLATE XXXIX.—TWENTY-SEVEN-YEAR-OLD CHERRY TREE RENOVATED.

Plate XXXVII. illustrates a three-year-old cherry tree growing on a steep hillside. The stem is only about 12in. high, but, being photographed from below, it seems taller. This tree thus far is an ideal shape, and is pruned systematically. Plate XXXVIII shows it pruned for the third winter. I ask my readers to compare this with Plate XXXVI. and imagine how much better the latter tree would be now if it had been treated as XXXVIII. has been. The owner of the tree shown in Plate XXXVI. has pruned that one figured in Plate XXXVIII. during the last two years, and expresses satisfaction with his work thus far.

In Plate XXXIX. a tree of the Black Heart variety is shown in a renovated condition. This tree was 27 years old when reworked with a superior kind, and the operation has been successful.

The renovation of old trees of the sweet cherry is not usually a success, and my inquiries elicit a certain unanimity of opinion on this matter with the exception of the sort shown herein, viz., Black Heart.

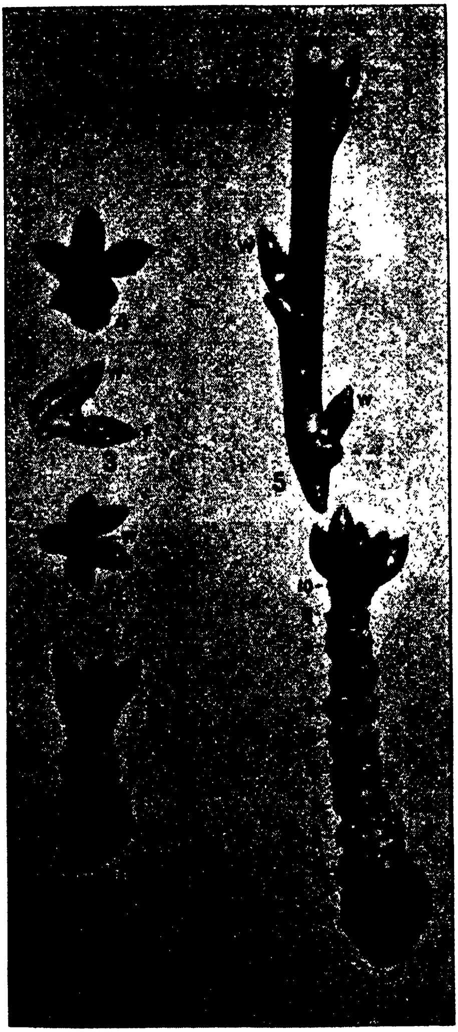

PLATE XL.—BUD STUDY OF CHERRY.

Plate XL. is a study in the bud formation of the cherry. Fig. 5 is an annual shoot, made last summer; on it are three buds—all wood buds. Fig 2 is a spur one year old. This time last year it was identical with the buds on Fig. 5. It is composed of five bloom buds and one wood bud located in the centre. Fig. 3 shows sections of two buds taken from a similar cluster to Figs. 2 and 4. The growing bud is in the centre, and is connected with the spur by a stout base; the bud marked F is joined to the spur by means of a narrow temporary connecting growth only. This is a bloom bud, and with the aid of a magnifying lens in it the folded stamens are readily detected. Fig. 1 is a spur with the growths of three seasons showing in the raised bands of scars, indicating where the bloom buds have been for two seasons. In Fig. 6 a very old spur is illustrated and the annual additions of growth may be readily seen.

Two shoots are shown in Plate XLI. Fig. 1 represents the annual lengths added over a period of four seasons, the terminal point of each being opposite the figures. This shoot has never been pruned. If it had been topped during any season we would not see the rosettes of spurs showing where each year's growth terminated, because the cluster of buds from which they arose would have been removed, as they are only found on a terminal point. It is at these rosettes where the "crotches" seen in Plate XXXVI. form. On this shoot the annual lengthenings of the spurs are clearly seen with each advancing year. Fig. 2 is a shoot which, after growing three years similarly to Fig. 1, received a check, and the annual rings at 3 show that the leading bud carried out the functions of fruit-bearing for a number of years prior to receiving sufficient stimulus to continue its extension. Some of the spurs on the lower portion of Fig. 2 are many years old, and 6 in Plate XL. is cut from this shoot. The other spurs, &c., in the same plate are cut from Fig. 1 in Plate XLI.

The study of these lateral growths shows them to be true spurs, as they lengthen from year to year. The central bud always being a growing bud explains why they lengthen terminally—not laterally, as is a fact with apple and pear. Their tenacity of life and slow process of lengthening show there is no need to shorten them; in fact, to do so would cut away their main, if not only, chance of extension. It also indicates that these trees could be allowed a great

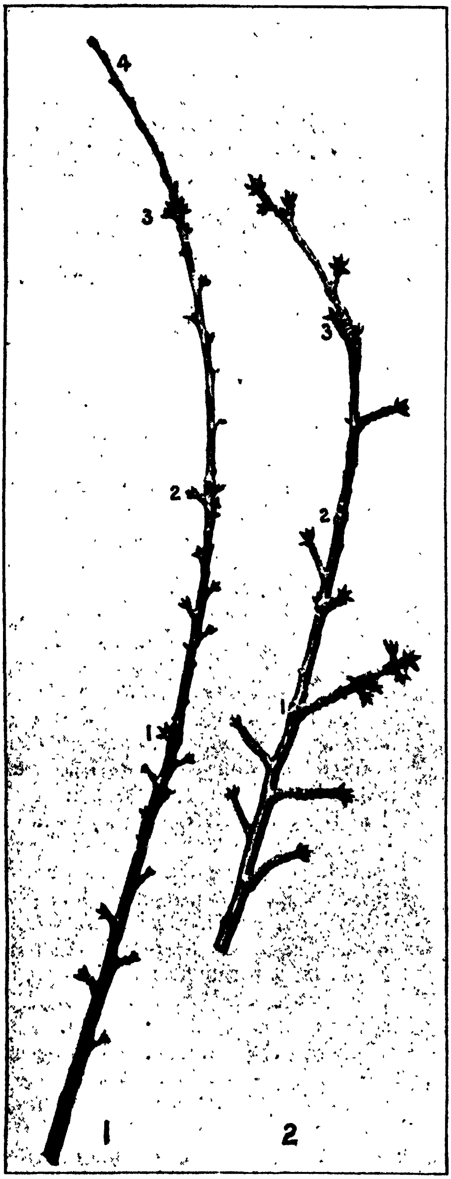

PLATE XLI.—SHOOTS OF CHERRY TREE.

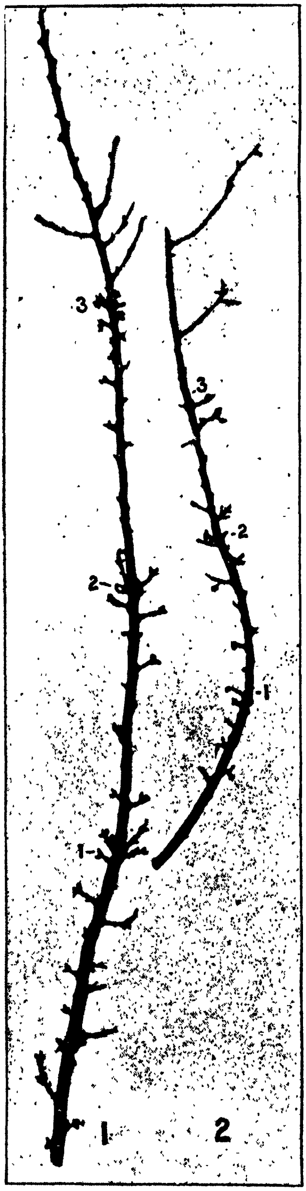

PLATE XLII.—SHOOTS OF ALMOND TREE.

many leading shoots and still abundant room would be found for the proper development of the spurs formed on them.

The resumption of growth as a leading shoot, after doing the work of a fruiting spur for some years, shows the possibility of shortening back shoots over these spurs if necessary. The great length of annual growth out of which a spur is forced from each individual bud upon leading shoots is a source of temptation to permit too rapid an extension of these shoots.

In the specific treatment of this tree, owing to the habit of slow development of the spurs, as illustrated in the last two plates, it would be of great advantage to cause the main shoots to subdivide freely during the first few years while they are close to the ground. This would give them stoutness and furnish a much greater quantity of fruiting wood within hand reach of the ground. It would also shade the stems and lower limbs from the midsummer sun—a factor probably worth more consideration in respect to the mysterious outbreaks of "gumming" which often occur on those parts. Pruned vigorously and trained correctly for the first four or five years there would, under ordinary conditions, be no need for taking out large limbs or making bad wounds upon hard wood later on.

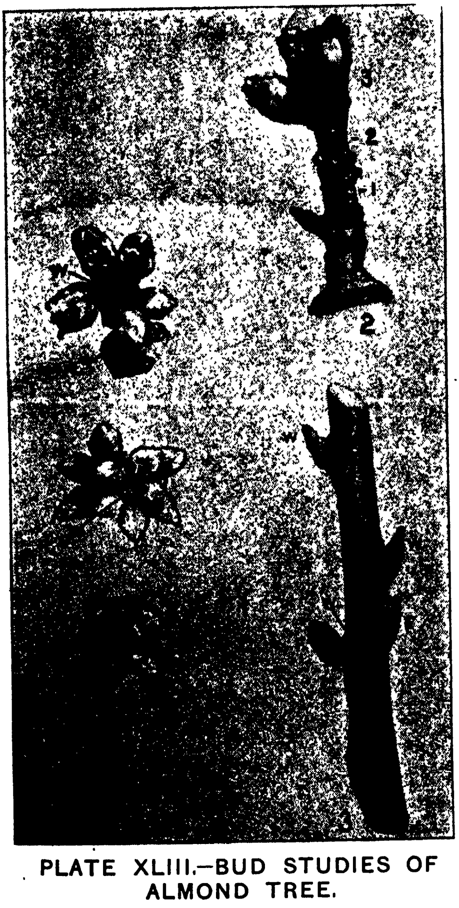

PLATE XLIII.—BUD STUDIES OF ALMOND TREE.

In the pruning of the various sections of cherries, viz, the sweet and sour varieties, it must be remembered their habits of growth are very dissimilar, and while the former erect-growing kinds require cutting to buds inclining outwards, the latter must be encouraged at first to take an upward tendency and should be cut to inner buds. There is no doubt that, as with most fruit trees, the grower of cherries who does not wait to set a good shape will gather cherries sooner than he who trains methodically; but will he gather larger quantities during each year of equal quality over the period of the tree's existence?

The Almond.

In this colony there is no tree receives less attention from the pruner than the almond. With most people a simple allusion to the subject makes one an object for sympathy. I will not venture to predict any benefit from the practice when applied to trees planted in parts of the colony where the climatic conditions are absolutely unsuitable, but I am fully convinced, if it were more generally adopted where the best kinds of almonds fruit fairly well, not only would better but more regular crops result.

Though usually planted as shelter breaks for other trees, the almond, to fruit properly, requires much shelter from cold winds itself, more particularly during the time of blooming here (July or August). It also requires much light, or the inner shoots are soon killed out.

As most of the varieties assume erect habits it is advisable to start the trees with a very short trunk, whether they are planted for shelters or fruiting only. The pruning of this tree is distinct from any other with which we have dealt, in the fact that it wholly consists of thinning out the main shoots from time to time, and encouraging the production of fresh ones to fill their places. If we examine Plate XLII. and trace the development of Figs. 1 and 2, the necessity

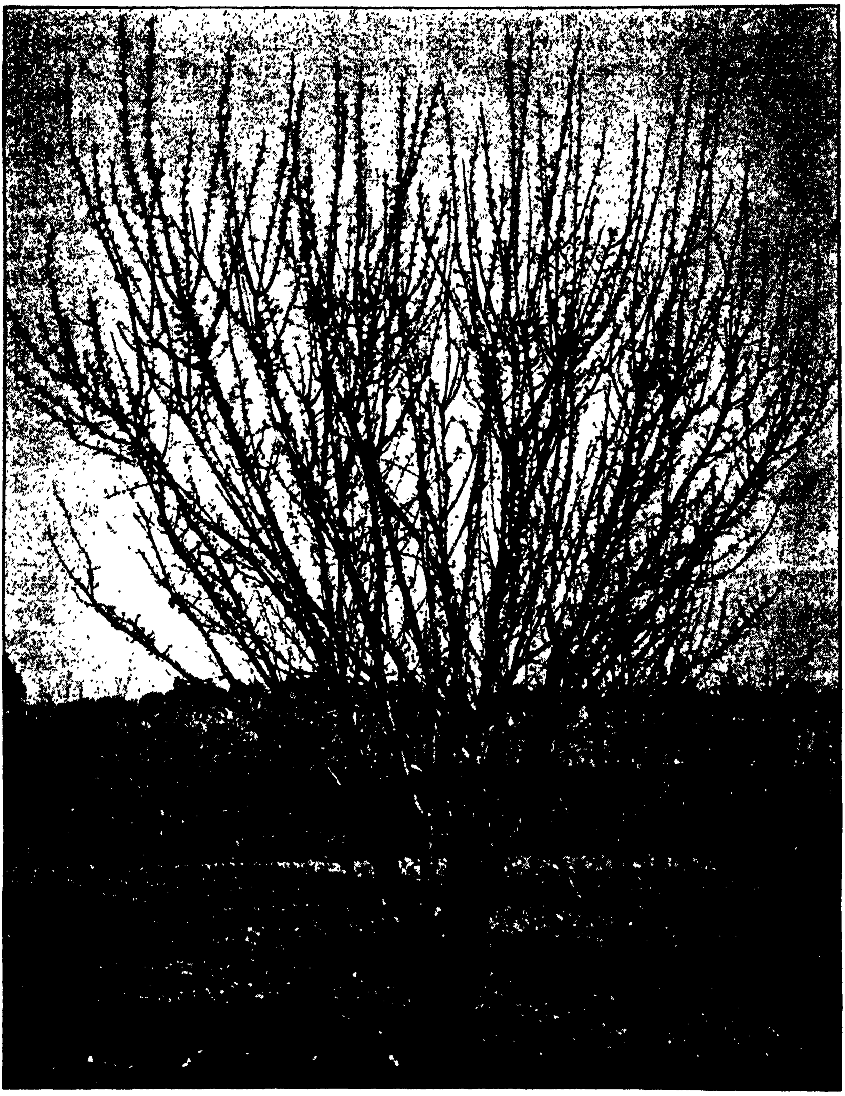

PLATE XLIV.—TYPE OF BRANDIS ALMOND.

for this course will be apparent. Fig. 1 is a leading shoot cut from the top of the tree shown in Plate XLIV. It represents four years' annual lengthenings, as shown by so many figures.

Compare this shoot with Fig. 1, Plate XLI. A close examination of the original showed fruit stalks upon it up to the figure 2, but not higher. Between its base and 1 fourteen almonds have matured. The buds on the short spurs on the wood two years old, as well as those on older wood below, show freely for bloom. The final growths made last summer also are supplied with bloom buds. These scarcely ever set into fruits after opening. We thus see that almond fruits are borne upon shoots two or more seasons old. Fig. 2 is a

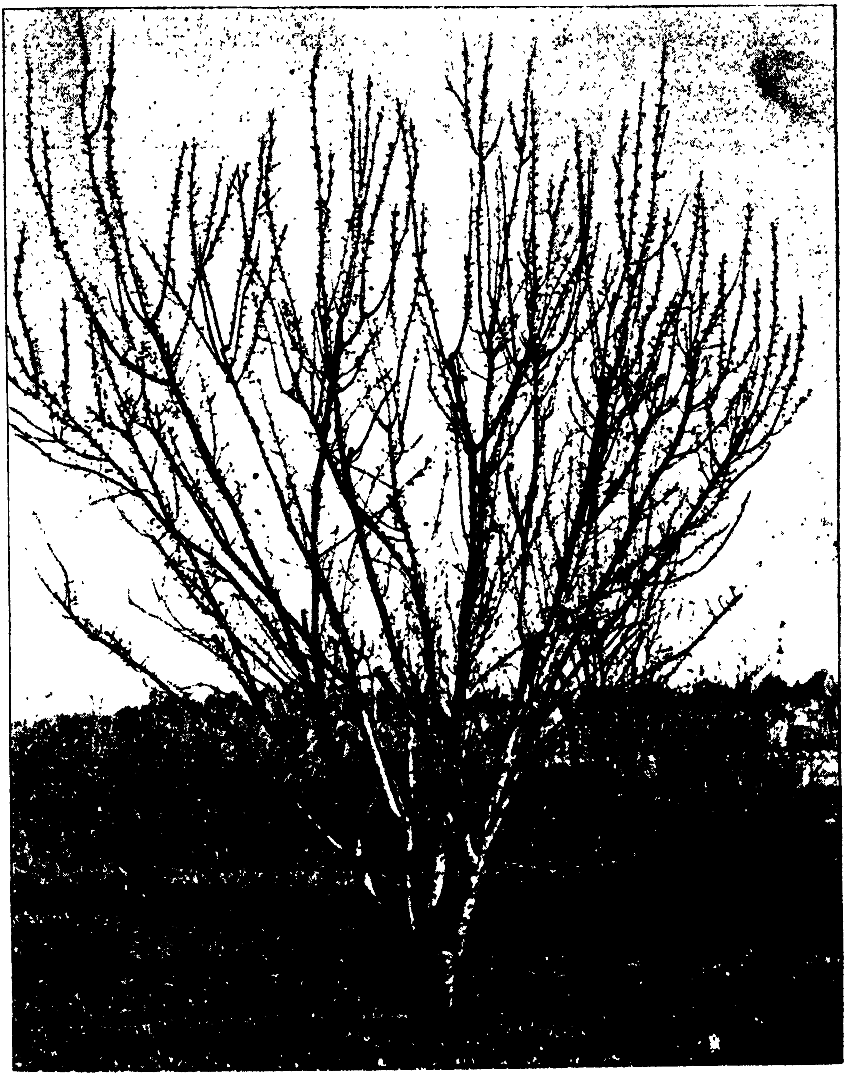

PLATE XLV.—METHOD OF RENOVATION OF NO. 44.

shoot which had a career similar to that described in Fig. 1, but its usefulness is pretty well over now. The terminal shoots are dead and quite three-fourths of the spur growth has also perished. Many fruit scars are left upon the lower portion, but its useful period had passed a couple of seasons ago.

If we turn to Plate XLIII., we see at Fig. 3 a piece cut from the annual leading growth, made last year, by shoot number 1 in the previous illustration; on it are growing buds marked W and flower buds marked F. As previously remarked, these flower buds on annual terminal wood nearly always fall and the wood buds grow into spurs or leading shoots. Fig. 2 is a spur of three years' development. The rings opposite 1 and 2 are made by scars where leaves or blooms have been located. No fruit has been matured on this spur yet. It has made a feeble attempt to branch laterally each time, and should the sap have been checked higher up near its point this sub-division may have succeeded. Fig. 1 illustrates terminal clusters of buds on similar spurs. In the centre of each is a wood bud at W. This, bar accidents, always continues the annual lengthening of the spur. Small growing buds are concealed below these clusters as indicated in Fig. 2. They sometimes grow, but owing to the dried-up enfeebled character of branching spurs on the almond they become quite useless after carrying a few fruits.

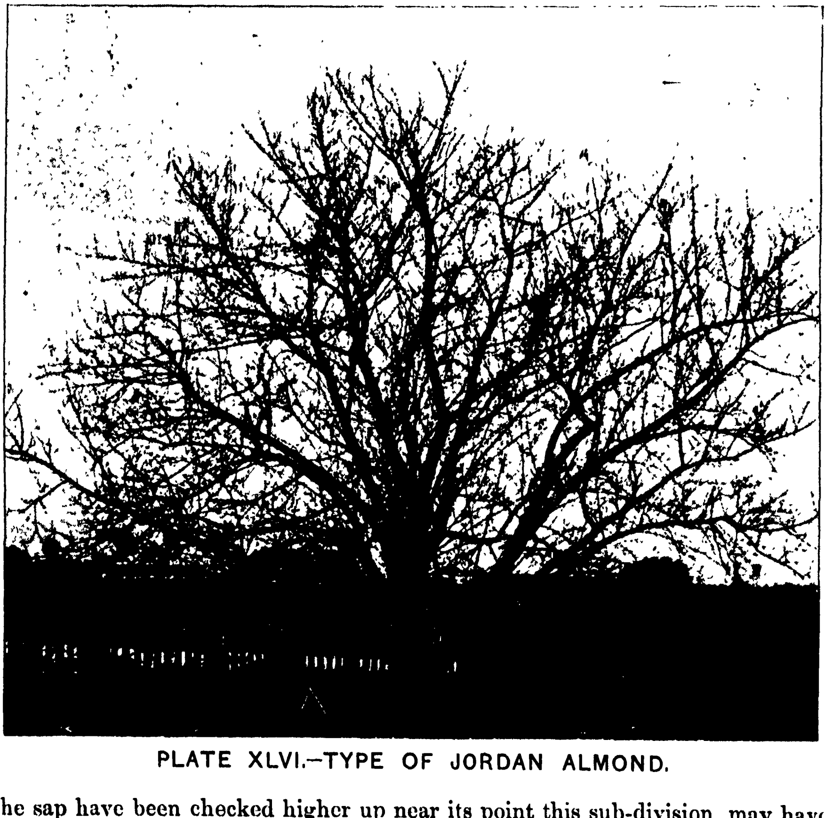

PLATE XLVI.—TYPE OF JORDAN ALMOND.

In Plate XLIV. a splendid specimen of the typical shape assumed by the Brandis almond is shown. This tree has been topped off and has produced a lot of fruit, but they were borne about 16ft. from the ground. The lower limbs have grown so closely together that many are simply bare spurless poles. This topping might have been done 6ft. or 8ft. lower down and better results obtained. If the trees were grown purely for the fruit they produced a few trees could be pollarded low down each winter, but this is not wise where they act a dual *rôle* of shelter and fruit producers. It is not the wisest plan, because all of the shoots do not become exhausted at the same time, and such wholesale pollarding would be wasteful.

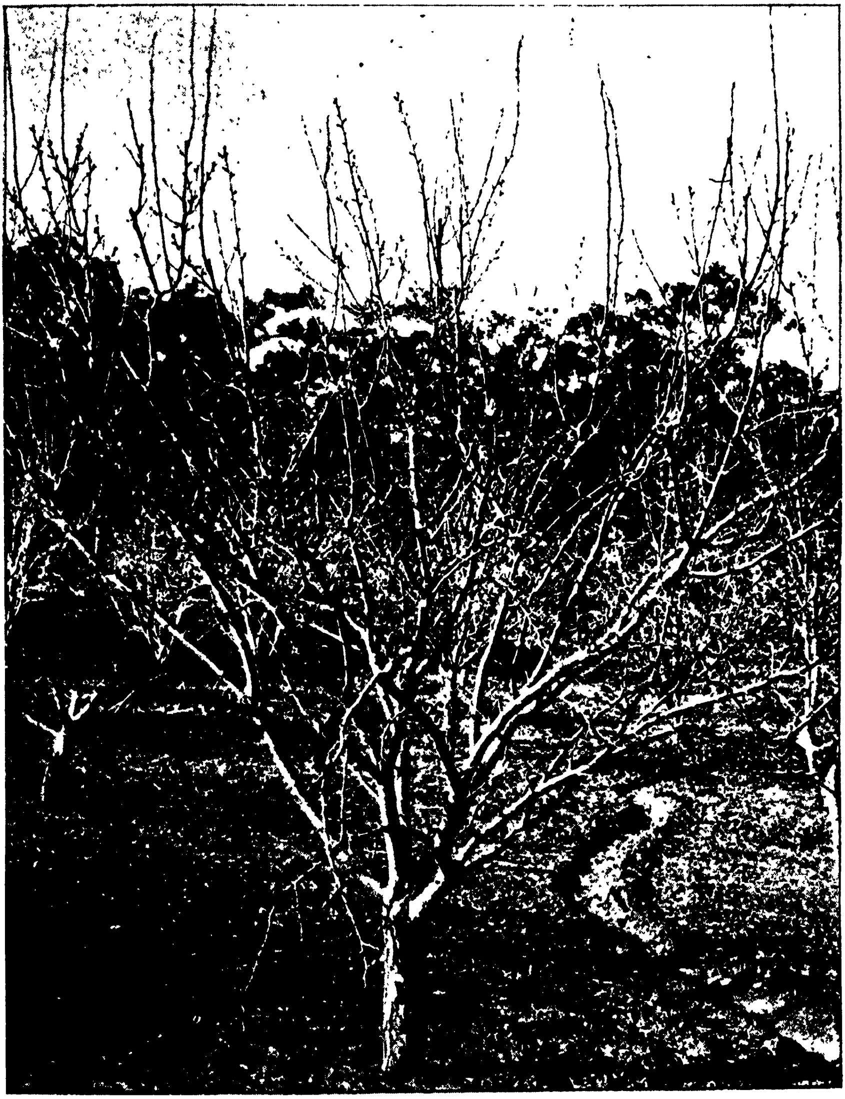

PLATE XLVII.—WELL-GROWN PLUM TREE.

In Plate XLV. I have shown this tree with about one-fourth of the limbs pollarded. The remainder will carry fruit and afford shelter. Next winter a few more limbs would be cut back, and so until a complete renovation had been effected. By this process during no season would the tree be too dense or the grower be bereft of a crop. It is necessary under this system to do a considerable amount of disbudding – pulling off sappy shoots—in spring to properly refurnish the tree, and to prevent overcrowding of the shoots, arising from the shortened limbs.

In Plate XLVI. a photograph of a large specimen of the Jordan almond is reproduced. This tree has never been pruned, and bears somewhat indifferently, and that only on the outer twigs.

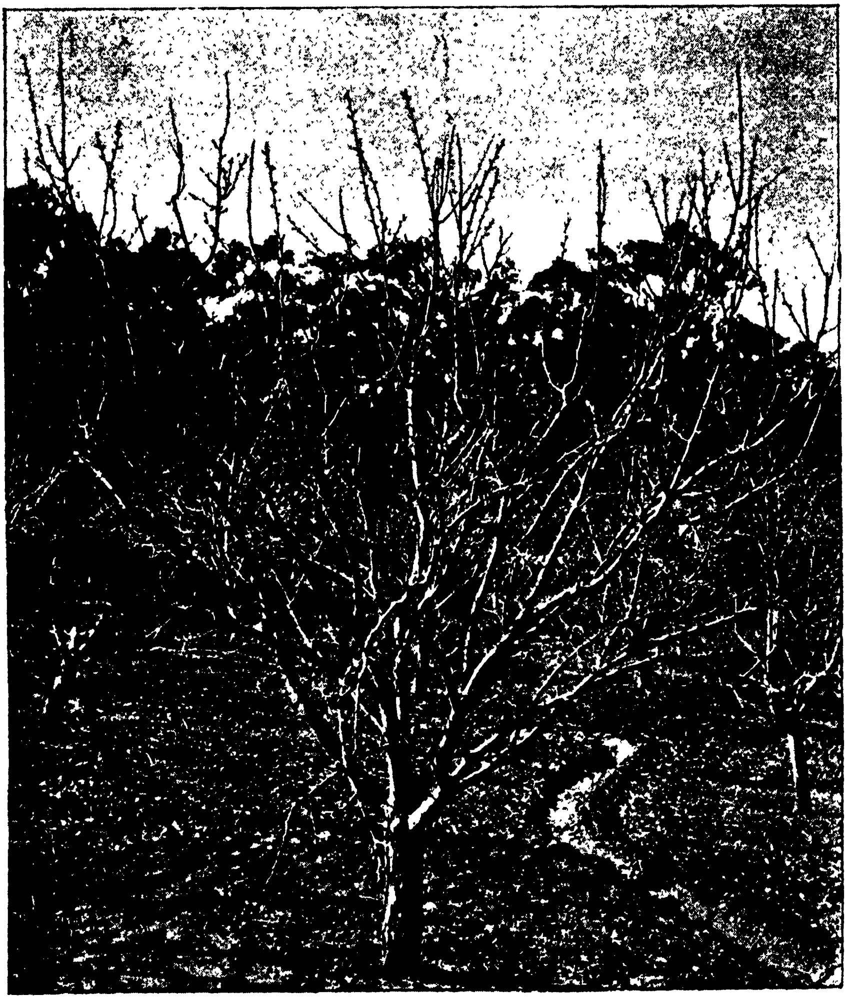

PLATE XLVIII.—PREVIOUS TREE PRUNED.

In the specific treatment of varieties those with a pendulous habit, such as the Nonpareil, should be pruned to induce a little more erect and compact form, and the erect-growing varieties treated with the object of spreading and lowering the branches. We can thus briefly sum up the pruning of the almond. Start the trees on a low stem. Induce sub-division of main shoots low down. Keep these shoots thinned out sufficiently to admit light throughout. Do not top them in winter when a sufficient number have been formed by sub-division. As soon as any show signs of being exhausted, dying out of fruit spurs or dying back at tips of leading shoots, begin the renovating method described herein.

It may be necessary to thin out the lateral growth occasionally on the lower portions of the tree, but usually the benefits are not worth the trouble.

The Plum.

This tree will bear longer and more constantly under absolute neglect of pruning than any other fruit tree we grow, but if the trees are to be prevented from becoming in after years merely straggling wrecks or dense thickets a regular system of pruning must be undertaken.

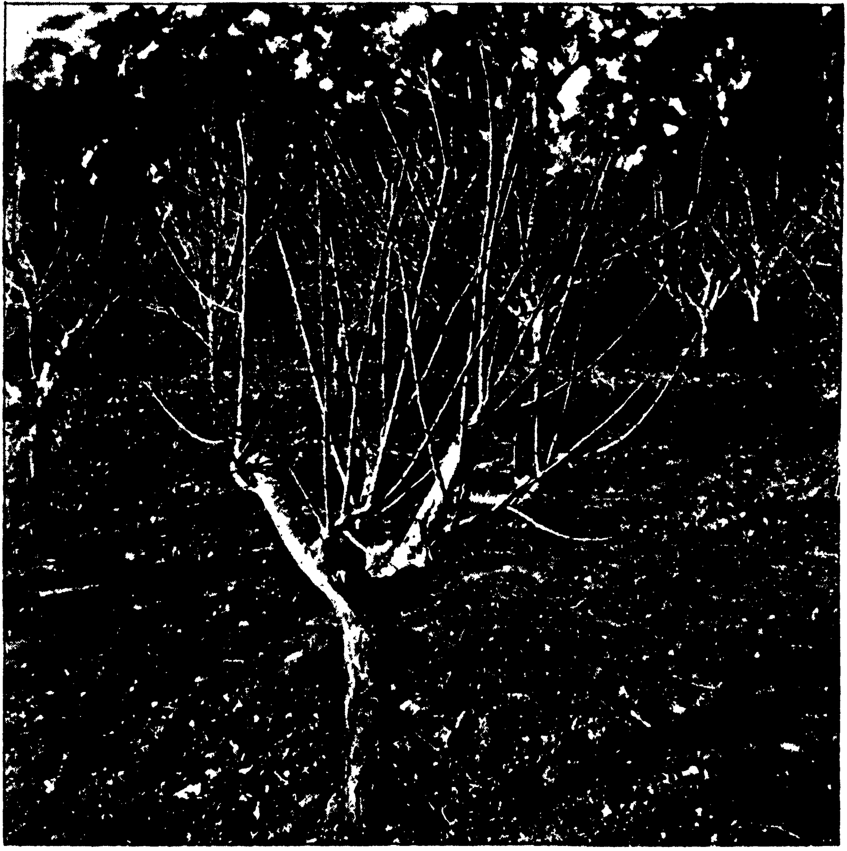

PLATE XLIX.—PLUM TREE RENOVATED BY BUDDING.

I know of no fruit which can be so improved in quality by a little judicious pruning as this. Owing to the tendency which the growths upon young or renovated trees have to extend very rapidly during the first few years it is absolutely necessary that hard pruning should be practised at this period. Plates IX. and X. in May issue convey a fair idea of the pruning to be applied to young plum trees to render them sturdy. Under ordinary conditions of growth the young trees should be pruned severely for three or four years ; then a much greater length can be left. The object of this is that while hard pruning is followed the tree will make rank growth and scarcely attempt to form fruit spurs, and the laterals will resemble the longest upon Fig. 1, Plate LII. Owing to the persistency with which a shoot of the plum will develop some sort of lateral from nearly ever bud formed upon it if that shoot be left unpruned, the pruner by leaving a greater or lesser length of shoot can regulate to a certain extent the kind of laterals formed thereon. For instance, if we refer to Figs. 1 and 2 on Plate LII. we will see that on a very vigorous shoot, likely to accrue from pruning more or less severely, the laterals will resemble those on Fig. 1, but on a shoot unpruned carrying many more buds the lateral growths will resemble those of Fig. 2; in other words, they develop bloom buds calculated to set and carry fruit sooner.

PLATE L. PLUM TREE BUDDED WITH BURBANK.

When long shoots have been retained and the spurs upon them have carried fruit they may, owing to their long slender development, assume a pendulous habit, and should this be excessive these shoots may be shortened back into older wood with no other damage than that arising from a temporary curtailment of the quantities of fruit produced. By this time the object of leaving the longer shoots will have been attained, viz., the tree will have gained a thrifty fruiting habit. Many growers deprive themselves of fruit from their plum trees for a much longer period by persistently pruning the main shoots severely year after year.

By this practice spurs are gradually forced out lower down, but the tree does not turn to fruitage. The object of keeping their trees in a shapely condition is a laudable one; but with the plum, after setting sturdy main and sub-main arms, allowing long shoots of from 2ft. to 4ft. to remain totally untouched in the winter pruning does no harm or creates little danger of disturbing the symmetry of the plum tree, for the reason stated before, that this tree can be safely cut back into older wood—an operation which often produces a stagnant dying-back condition in the apple tree.

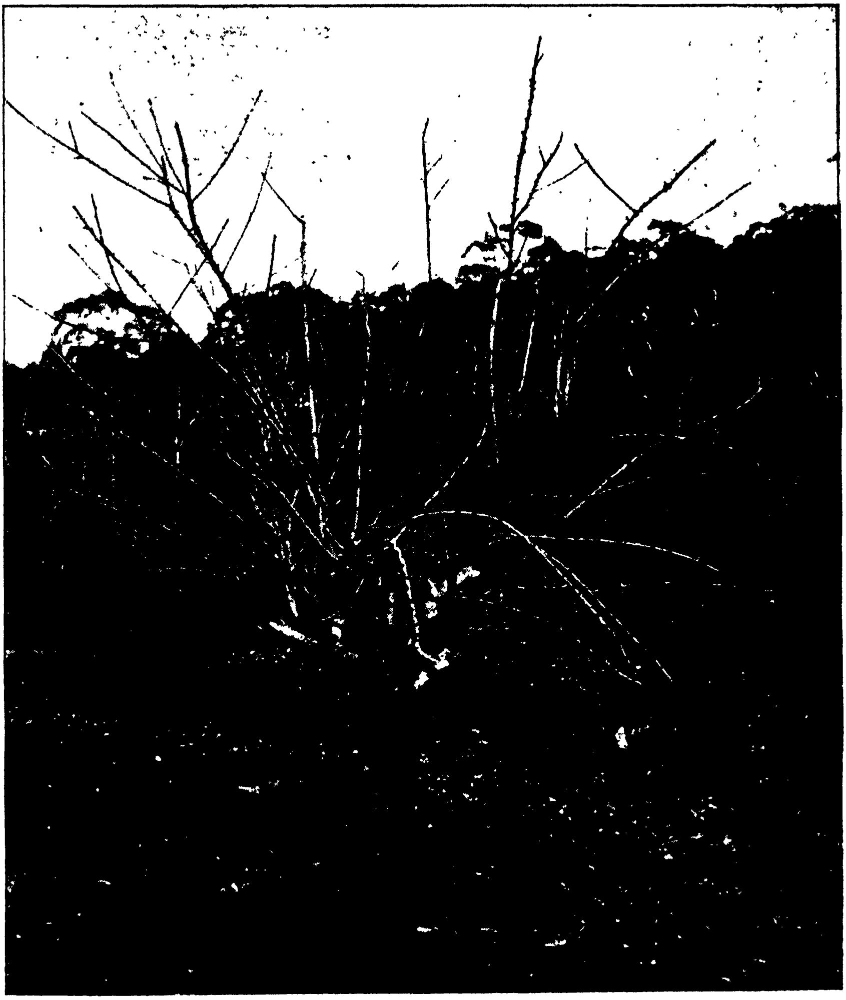

PLATE LI.—PREVIOUS TREE PRUNED.

A plum tree carefully formed upon the lines suggested above requires very little pruning in after years, beyond the fact that to ensure the production of first-class fruit the fruit spurs should be thinned out judiciously from time to time. No branches should be allowed to cross others to their detriment. Respecting the leading shoots it is well to always induce a certain steady activity of growth by shortening in the annual growths a trifle. This will stimulate root action and conduce to a healthy thrifty habit, and at the same time prevent the formation of weakly sap-checking crotches.

In Plate XLVII. a fine sturdy plum tree of a thrifty fruitful habit is shown.

Plate XLVIII. conveys a fair idea of the small amount of pruning necessary at this stage, as the same tree will be readily recognised.

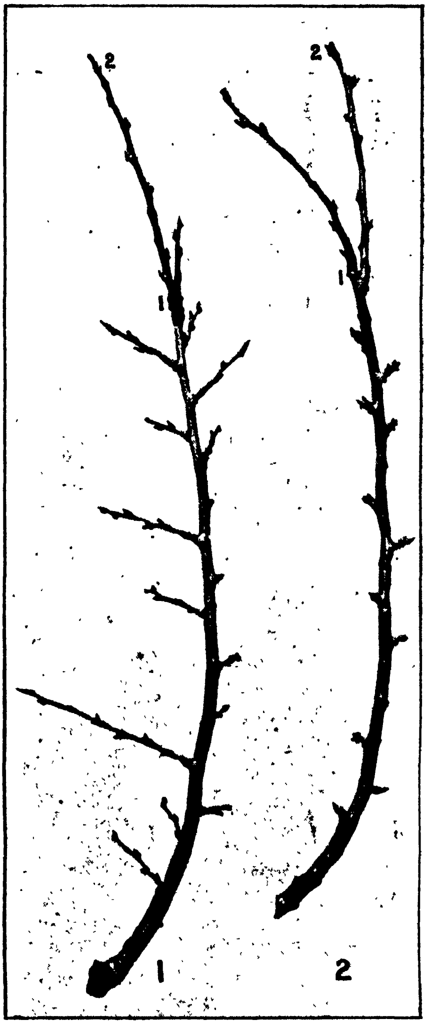

PLATE LII.–TYPES OF SHOOTS FROM PLUM TREE.

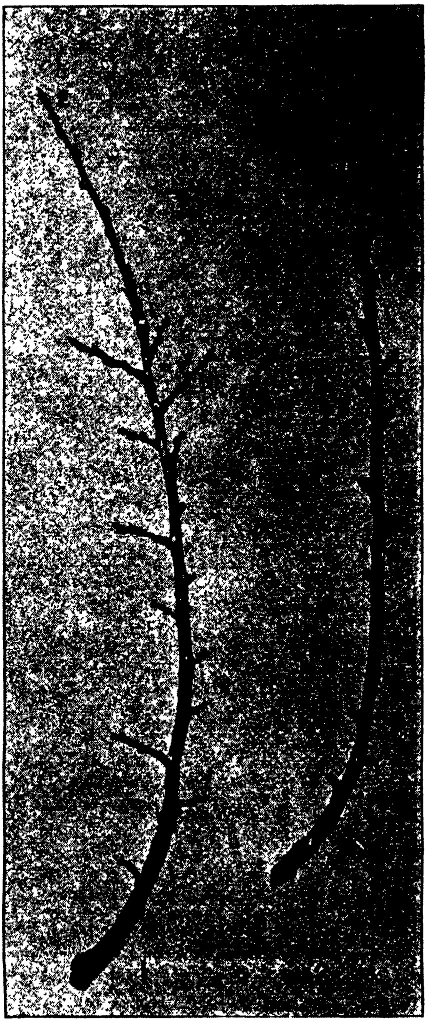

PLATE LIII.–PRUNING OF SHOOTS IN PREVIOUS PLATE.

When plum trees fail at the top, or are of a variety which has ceased to be remunerative, they may be safely cut back to the main arms, and either grafted into the old wood or budded upon young shoots which emerge therefrom.

Plate XLIX. shows a tree treated by the latter method, and the renovation has been successful.

In Plate L. I have figured another instance of refurnishing. This tree has been reworked with the Japanese plum Burbank, and the characteristic growth will be recognised—it could be measured in yards. Upon these lengthy shoots the short closely-set fruit spurs may be seen in abundance.

Plate LI. shows the tree pruned inconsiderably—almost to two-year-old wood. This tree bore enormously last year, and promises to do so again this summer. The outer limbs are taking pendulous form in consequence, but as these can be shortened back with safety at will it is well to get as much fruit as possible from them while they maintain a reasonable form.

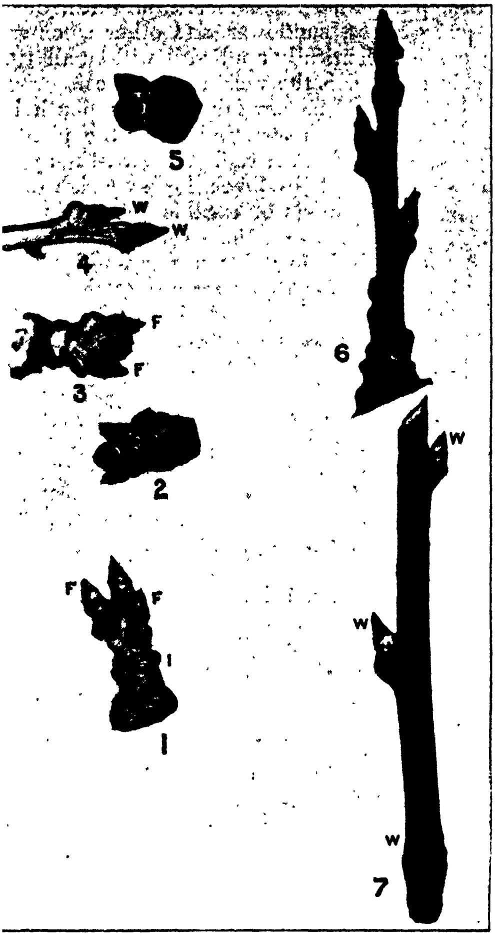

PLATE LIV.—BUD STUDY OF PLUM.

Plate LII. illustrates two types of shoots. No. 1 grew upon a tree which had been pruned severely two years ago this winter, and it grew vigorously during the following summer. Not being pruned in the next winter it sent out a lateral of varying length at each bud upon its whole length, which is over 2ft. The leading shoot arising from the terminal bud was checked in its growth thereby. The second shoot, Fig. 2, is taken from a tree of fruitful habit, and received less stimulus; it is one year older than the first shoot. The lateral shoots are fruit spurs which would bloom next spring. At 1, owing to the top bud cluster not being cut away, a weakly crotch has formed.

In Plate LIII. the pruning of these shoots is illustrated. In both the crotch has been obliterated. On No. 1 the longest laterals have been shortened back. The amount of shortening applied to such laterals depends upon the space which can be allotted to them individually.

Plate LIV. is a bud study of the plum. Fig. 7 is a piece of annual shoot carrying single wood buds only. Fig. 6 is a lateral clipped from the first shoot in the previous plate. It shows scars where leaves have been, and where buds may grow at its base if emergencies arise to stimulate them. Figs. 1, 2, and 5 are fruit spurs cut from the second shoot in Plate LIII. The dissimilarity to the arrangement upon the spur of other flower buds we have examined is confusing to the beginner. The growing bud is set in the apex, and is terminal. Figs. 3 and 4 are sections of the buds on growths like 1, 2, 5, and 6 respectively. On Fig. 4 the buds are readily distinguishable as growing buds. On Fig. 3 the sections of folded stamens are easily seen in the original. As with the almond, peach, and apricot, triple buds, consisting of a wood bud between two flower buds, are often found on annual shoots of the plum; but with the exception of the Japanese varieties these bloom buds seldom adhere.

FARM HINTS FOR AUGUST.

By the Editor.

As soon as possible ground should be prepared for all kinds of sorghums (including amber cane, dhurra or Kaffir corn, planters' friend, holcus, millets, etc.), maize, beets, mangolds, melons, pumpkins, rape, lucern, mustard, Bokhara clover, chicory, buckwheat, poa grasses, sunflower, and other summer-growing fodder plants. If manure can be plentifully applied it will be all the better. Kinds of crops should be selected to suit the various localities.

The main crops of mangolds and beets should be sown during this month in the early districts. Drill the seed in rows 30in. apart, and single the plants, when up, to 18in. apart. In very good soil with fair rainfall 30in. x 24in. apart will be better. In shallow soils sow Orange or Red Globe; for deep rich soils use Long Red or Mammoth varieties. Six pounds of seed is enough for an acre.

Broad beans are well worth sowing now, both for table use and as food for stock. The leaves and stalks are also acceptable to horses and cattle. Sow now in drills 4ft. apart for tall sorts, and 2ft. 6in. for dwarf kinds, with 6in. to 8in. between the plants in the rows. Keep the soil constantly loosened with the hoe. Old farmyard manure is best, especially if gypsum has been used to retain ammonia.

Lambs dropped in April and May are likely to give best results for export: but at that time grass may be very scarce, and yet the ewes must be well fed. One easy way out of the difficulty is to provide ensilaged fodder. If in pits, the pits should be got ready very soon. Three tons of green stuff would make less than 1 ton of hay; but the same amount of green vegetation would make nearly 3 tons of ensilage, and a ton of ensilage will go nearly as far as a ton of hay in feeding live stock.

Sunflowers should be sown now in rows 30in. x 18in. apart. Black-seeded Russian is best for oil-makers. An acre should yield 50bushs. seed and a lot of leaves besides for stock. This quantity of seed would yield 50galls. of oil and 1,500lbs. oilcake. Seeds, or cake, should be fed only in moderation to fowls, cows, pigs, horses, or sheep, as too much is apt to disagree with the animals. Potassic manures are best for this crop.

Mustard should be sown now in drills 2ft. apart if for seed, or broadcast if for fodder. It will grow very rapidly. Five pounds of seed is sufficient, if drilled, for one acre. White mustard gives the largest quantity of forage. Either brown or white mustard is excellent to plough under as a green manure.

Plant some potatoes in rows 3ft. x 1ft. apart, 4in. deep, or 24in. x 12in. for garden cultivation. Use tubers as seed about 4ozs. weight, and cut in halves lengthwise. Brown's River, Beauty of Hebron, and Pinkeye are best for plains and general cultivation. Keep the rows constantly loosened up. Use very old manure. Planting may continue up to middle of October.

Carrots and parsnips should be grown for cows and horses as well as for the table. Both roots require similar treatment, but parsnips will grow well in rather stiffer soils. Dig or plough deeply and pulverise as much as possible. Place most of the manure at the bottom and mix a little very old manure with the soil. In deep soils grow the long varieties of carrots and in shallower ground sow Shorthorn varieties. Parsnips should stand 13in. x 12in., carrots 12in. x 8in. Sow a few radish seeds along the drills so as to mark the lines, and directly the carrots show up hoe between the rows and pull out the radishes. Hoe frequently afterwards.

Ewes which have had their lambs taken from them should be kept rather short of food for a short time, to prevent the production of milk. Lambs should be castrated when one month old. *Re* shearing, make haste slowly. Many sheep are killed by frost after being shorn too early.

Pigs for fattening should now be penned up and all green vegetable food kept from them, as this gives a peculiar flavor to the meat. Milk, meal, and peas are excellent food for fattening pigs. Pigs of 60lbs. to 80lbs. each are the most profitable to raise.

Sow rape upon rich well-tilled land. Three pounds of seed drilled is enough for an acre, or 5lbs. to 6lbs. broadcast. Good crops have been raised upon wheat-sick land without manure, but it is rather risky to sow on poor soil.

For lucern the soil should be deep, friable, and fairly moist, or having water in the subsoil within 12ft. It will grow in some places where these conditions are not all present, and it is always worth a trial on rich, deep, friable and sandy soils. The land should be thoroughly well prepared, with a surface fit for an onion bed, and as level as it can be made. Do not sow until all danger of ground frosts attacking the tender plants is over. Drill in the seed at rate of 10lbs. per acre in drills a foot apart, and not more than ¾in. deep. Calcareous soils are best for lucern, and Thomas phosphate will probably be a good fertiliser. Prepare the land now, and sow about end of next month.

Vetches, lentils, and lupins may be sown now upon light soils. These are fairly good sandbinders, and enrich the soil when ploughed under. The first two are excellent fodder plants.

Prepare land for sowing with summer fodder plants.

PURCHASE OF COMMERCIAL FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

With the experience of the 1899 manure season in mind, I would respectfully offer the following suggestions to purchasers of fertilisers: —

In the first case insist on canvassers for orders stating definitely at least the minimum contents of the fertilisers. This can always be done where reputable brands are dealt in.

Do not sign orders for fertilisers without stating minimum of contents guaranteed. If this precaution is not taken there is nothing to compel the dealer to deliver the best quality article, while the order is binding on the person signing. An instance of the necessity for paying special attention to this point is afforded in the analyses of samples of Thomas phosphate taken by myself last season. The usual standard is 17 per cent. to 20 per cent. phosphoric acid, and very rarely do the analyses show under 18 per cent., but one or two have gone from 14·5 per cent. to 15·5 per cent. If "so many" tons of Thomas phosphate are ordered without statement as to quality, the dealer may supply the poorer quality, and the purchaser has no remedy provided the invoice shows the correct analysis.

When ordering superphosphates insist on the percentage of soluble phosphate (*i.e.*, tricalcic phosphate made soluble) being guaranteed and set out on the order. This should not be less than 35 per cent. with English (mineral) superphosphate. Dealers are always in a position to guarantee this, as they purchase it in the first place on the guaranteed analysis of the manufacturer. Do not allow the total percentage of phosphate to be stated without showing how much is soluble and how much insoluble.

In purchasing bonedust compare the analyses of the various brands first. This is absolutely necessary if an economical outlay of money is a consideration. Bearing on this point it may be mentioned that of the samples analysed for the department last season there was a variation of 16 per cent. of tricalcic phosphate and 1·5 per cent. of ammonia between the highest and lowest samples, while the margin between highest and lowest price was under £1. The lowest quality was not the lowest in price by 10s. per ton.

Fineness of grinding is another matter of importance when purchasing either Thomas phosphate or bonedust, especially the former. Professor Wagner, a recognised authority on Thomas phosphate, states that finely ground its action is four times as quick as if coarsely ground. The standard fineness for Thomas phosphate is that it will pass through a sieve with 10,000 meshes to the square inch. In all the American official publications a higher value is also placed upon finely-ground than upon coarsely-ground bonedust. Fine bonedust should pass through a sieve with meshes of one-fiftieth of an inch. The authorities referred to place the value of the phosphate 14 per cent. higher, and the ammonia 25 per cent. higher in fine bonedust than in coarse.

Some vendors advertise bonedust, guano, or other phosphatic fertilisers as containing 30 per cent. to 40 per cent., or 40 per cent. to 50 per cent. of tricalcic phosphate. Guarantees of this character are only binding on the vendor to the minimum amount stated, and purchasers must not expect more than 30 per cent. of phosphate where the guarantee reads 30 per cent. to 40 per cent. If the fertiliser contains more than 30 per cent. the vendor will take care to guarantee it, and if it does not, no good purpose is served by stating it as 30 per cent. to 40 per cent. In comparing prices purchasers must always take the lower amount as being most likely to be the correct statement of the contents of the fertiliser.

Finally, order early, and deal with firms who have a reputation to lose and who are permanently engaged in the trade. During the past two seasons those who ordered early have not only avoided the necessity for rushing round for their requirements a few weeks before they start sowing, resulting in many cases in delay of seeding operations, but have also saved several shillings per ton in price. With the present active competition in the trade prices are cut very fine, and it will be rare for any reduction of moment taking place on the advance order price for cash, while rises are not unlikely in view of the probable large increase in the demand for fertilisers next season.

Worms in Horses.—There are several sorts of worms which infest the stomach and intestines of horses. For stomach worms give one pint of linseed oil and three fluid ounces of oil of turpentine. For thread worms inject one quart linseed oil and six fluid ounces of oil of turpentine. Keep a lump of rock salt in every horse's manger. After the worms are passed give the following powder twice a day for a fortnight:—Sulphate of iron, one drachm; carbonate of soda, one drachm. Keep the animal covered during cold weather. Give a bucket of water before each feed. Give nourishing feed, not too much. Give linseed or bran mash occasionally.

Remedies for Red Spider.—The *California Fruitgrower* states that the following treatment has been proved by many orchardists to be a certain cure for red spider. Dissolve 15lbs. lime, 2lbs. caustic soda, and 2½lbs. salt in 40galls. of water, add 4ozs. white arsenic. Mix thoroughly and keep stirred while spraying. This should be applied as soon as the crop is off the trees, to the trunk and main forks and for 2ft. round the trees. The rain will carry the solution down to the roots and destroy the eggs of the spider.——Another remedy very strongly recommended, and easier to make than the lime, salt, and sulphur mixture, is the following:—Take 20lbs. sulphur and mix it to a paste—not sloppy—with cold water, then add 10lbs. caustic soda 98 per cent., and it will boil like lime slacking. Have 20galls. of water at hand and add it as the sulphur boils, to prevent burning. This makes a stock solution. For use add ½gall. of the solution to 40galls. water, strain and spray.

MONTHLY RAINFALL.

The following table shows the rainfall for July: —

Adelaide	0·36	Riverton	0·18	Callington	0·37
Wilson	0·13	Tarlee	0·11	Langhorne's Bridge	0·72
Quorn	0·56	Stockport	0·33	Milang	0·96
Port Germein	0·14	Hamley Bridge	0·08	Wallaroo	0·34
Port Pirie	0·15	Kapunda	0·19	Kadina	0·25
Crystal Brook	0·17	Freeling	0·13	Moonta	0·27
Port Broughton	0·44	Stockwell	0·53	Green's Plains	0·40
Hammond	0·16	Nuriootpa	0·38	Maitland	0·65
Bruce	0·34	Angaston	0·59	Ardrossan	0·58
Melrose	0·66	Tanunda	0·43	Port Victoria	0·26
Wirrabara	0·36	Lyndoch	0·55	Curramulka	0·61
Appila	0·09	Mallala	0·36	Minlaton	0·64
Laura	0·36	Roseworthy	0·15	Stansbury	0·65
Caltowie	0·12	Gawler	0·28	Warooka	0·52
Jamestown	0·17	Smithfield	0·14	Yorketown	0·57
Gladstone	0·26	Two Wells	0·38	Edithburgh	0·53
Georgetown	0·18	Virginia	0·24	Fowler's Bay	1·27
Narridy	0·13	Salisbury	0·17	Streaky Bay	1·29
Redhill	0·18	Teatree Gully	0·59	Port Elliston	0·86
Koolunga	0·15	Magill	0·49	Port Lincoln	1·01
Carrieton	0·18	Crafers	0·93	Cowell	0·52
Eurelia	0·18	Clarendon	0·83	Queenscliffe	1·26
Black Rock	0·13	Morphett Vale	0·49	Port Elliot	1·04
Petersburg	0·17	Noarlunga	0·52	Goolwa	1·10
Yongala	0·32	Willunga	1·41	Meningie	0·86
Torowie	0·14	Aldinga	1·04	Kingston	1·94
Yarcowie	0·37	Normanville	0·90	Robe	3·18
Hallett	0·52	Yankalilla	1·11	Beachport	3·23
Burra	0·99	Eudunda	0·64	Bordertown	0·57
Snowtown	0·28	Truro	0·49	Wolseley	0·46
Brinkworth	0·14	Mount Pleasant	1·32	Frances	0·64
Blyth	0·12	Blumberg	1·01	Naracoorte	0·92
Clare	0·38	Gumeracha	0·89	Lucindale	0·94
Mintaro Central	0·50	Lobethal	1·19	Penola	0·97
Watervale	0·38	Woodside	1·32	Millicent	2·62
Auburn	0·22	Hahndorf	1·07	Mount Gambier	2·65
Manoora	0·19	Nairne	1·36	Wellington	0·43
Hoyleton	0·21	Mount Barker	1·49	Murray Bridge	0·91
Balaklava	0·15	Echunga	1·29	Mannum	0·45
Port Wakefield	0·63	Macclesfield	1·83	Morgan	0·11
Saddleworth	0·23	Meadows	1·60	Overland Corner	0·24
Marrabel	0·39	Strathalbyn	0·82	Renmark	0·47

WEATHER AND CROP REPORTS.

Amyton.—Excepting for two or three light showers, no rain has fallen for over four weeks. The weather has been intensely cold, and frosts are frequent. The crops need a good soaking. Fallowing is general, and farmers are breaking up as much land as possible.

Angaston.—Rain is greatly needed. A succession of severe frosts has been experienced. Splendid average of lambs obtained. Pruning is well advanced; feed is plentiful, though suffering from frost. With a good fall of rain there would be every prospect of a favorable season.

Balaklava.—Very little rain, but frequent sharp frosts experienced during the month. The continued cold weather is retarding the growth of crops and feed, and rain is badly needed. Fallowing is well advanced, and operations will be finished early in August.

Barootа Whim —Crops are looking healthy, but need rain. Rainfall for June, 2·44in.

Burra.—Owing to continuous frosts the late crops and feed are very backward. A copious fall of rain is wanted.

Burra (West of).—July has been very dry and cold, with long succession of frosty nights. Early crops look well, but the late sown and feed is suffering. A small grub is doing much damage in one paddock, destroying both crop and weeds.

Dowlingville.—Crop prospects not too bright owing to continued dry, cold, frosty weather, which has checked the growth. Rain is badly needed, as the subsoil has not had a good soaking this winter. If it does not come soon many will have to start carting water. Stock in fair condition, but feed is not abundant. A fair percentage of lambs recorded this season.

Elbow Hill.—Warm days and cold nights prevail, and vegetation seems to be at a standstill. Feed is scarce, and on the whole the prospects are not very bright. Rainfall for six months not quite 5in. A heavy fall would do much good.

Inkerman.—No rain for nearly four weeks. A succession of frosty nights has been experienced, consequently the crops are making little progress. Rain is badly wanted. Stock in fair order.

Kapunda.—Vegetation makes very little growth owing to the cold frosty weather. Rainfall for six months, 9·32in.

Lucindale.—Owing to the mild season the crops and feed are looking very well. Rain fell on six days during July, being under the average, but quite sufficient for the needs of the district. Lamb-marking is general, and the average is well over 80 per cent. Stock are healthy, but complaints of damage by foxes numerous.

Koolunga.—The crops are beginning to show the effects of the cold dry weather. The manured and drilled crops look much better than the other. It has been exceptionally frosty during the month. Fallowing is nearly completed.

Mallala.—We are having very dry and frosty weather, no rain of any consequence being recorded during the month. Unless we have rain soon the crops will suffer severely.

Minlaton.—Very little rain, but a great deal of frost experienced during the month. Crops not making much progress, and rain is anxiously looked for. Most farmers are busy fallowing. No reports of damage by grubs to crops received.

Mount Pleasant.—Stock doing well, and crops making fair progress. Rainfall for June, 4·34in.; July, cold and frosty.

Mount Remarkable.—June was a very favorable month, good rains and nice cloudy weather. July has been cold and dry. Crops look healthy, but have been kept back by the cold

Pine Forest.—Very little rain and severe frosty weather experienced. Feed is backward, but crops look well, especially those drilled in early. Stock generally in fair condition.

Pyap.—Rainfall for month ending July 19th, 1·92in. Crops healthy and making good progress on the sandy flats. Live stock doing well.

Reynella.—Unfavorable weather for July; coldest on record for this locality. It has also been very dry, and vignerons are anxiously looking for rain to soak into the subsoil. Crops and grass not injured by the cold, but make no growth.

Saddleworth.—Three weeks of continuous white frosts has caused feed and crops to be backward. Fallowing is well forward, though the ground is becoming rather dry for good work. Good percentage of lambs. Trials of disc ploughs have been conducted locally.

Watervale.—Weather very cold and frosty. Feed and crops suffering from cold and want of rain.

Wilmington.—Splendid rains fell during June, and in early part of July nice showery weather was experienced, but we are now having cold frosty weather, which is retarding the growth of feed. Fallowing is being pushed on.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— July 31, 1899.

But for the very favorable weather experienced during June, our agriculturists would now be in rather a bad plight, July having established a dry cold record for what is usually our wettest month. A succession of frosts continued for more than a fortnight, with the result that vegetation generally is at a standstill in most places, but if a change should set in soon, with the fair amount of moisture that we had previously, there is time enough for a good spring opening. The frosts have done some harm to early potatoes and vegetables, but in other directions, if followed by favorable conditions, no ill effects need be feared.

The commercial outlook is fairly satisfactory, and, with the possibilities of improved prices for our staples, such as wheat and silver, that have not yet responded to the general rise which has taken place in nearly all leading products, the future may be considered promising. The advanced prices that have been established for wool, lead, and copper, are strongly maintained.

The absence of unfavorable conditions in most of the wheat countries of the Northern Hemisphere renders it almost certain now that an average crop will be reaped; although there is no probability of reaching the aggregate yield of last year, which was more than ordinarily prolific. A surplus will be brought forward, but which, even if added to the present crop, is not likely to start the year with as heavy stocks as the previous one; and to this may be attributed the buoyancy which exists, speculators appearing very willing to operate on chance of a rise. Local and intercolonial trade in breadstuffs has only been of a hand to mouth character. Offal lines have been dull, Victorian rates checking export trade in bran and pollard. Feeding grains are quiet, and the advance in freights has for a time interfered with the exportation of chaff.

Imported potatoes now control this market, an easing in price of 5s. per ton a few days ago intercolonially being at once reflected here by lower quotations for Tasmanians, which are most in favor, and at present monopolising the city trade, though at Mount Gambier supplies are gradually being worked down.

The month's business in onions has been unusually light, but stocks notwithstanding are so closely held there is a further tendency to force the market up.

The heavy frosts that occurred had the effect of not only checking the downward trend in value of butter and eggs, but caused the market to even firm up by retarding the seasonable increase, butter improving temporarily about 1d. per pound, whilst eggs again advanced 3d. per doz.; both lines, however, are now again moving down towards spring rates under the influence of growing supplies, but from appearances intercolonial demand will absorb surplus for some time to come, judging by the extensive inquiries The scarcity of well-conditioned cheese has caused values to slightly advance for this grade, but dry and inferior is still rather difficult to quit, although stocks are getting low. Good trade, for time of year, has been doing in bacon, and values in this line also are a shade firmer. Hams rather scarce. Honey somewhat sluggish. Beeswax scarce. Almonds in excellent demand. Good business in poultry, both live and dressed, and although considerable quantities of carcass meat, particularly pork, have been marketed from week to week, prices have been satisfactorily maintained.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Farmers' lots at Port Adelaide, 2s. 9½d. to 2s. 10d.; outports, 2s. 7d. to 2s 9d. per bushel of 60lbs.

Flour.—City brands, £6 15s. to £7; country, £6 5s. to £6 10s. per ton of 2,000lbs.

Bran, 8¼d.; pollard, 8¼d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 7d. to 1s. 10d.; good stout white, 2s. 3d. to 2s. 8d. per bushel of 40lbs.

Barley.—Malting, 2s. 9d. to 3s.; Cape, 2s. to 2s. 3d. per bushel of 50lbs.

Chaff.—£3 to £3 5s. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Mount Gambiers, £2 17s. 6d. to £3 2s. 6d.; Tasmanian and New Zealand, £3 2s. 6d. to £3 10s. per 2,240lbs.

Onions.—£7 to £7 2s. 6d. per 2,240lbs.

Butter.—Creamery and factory prints, 10d. to 11½d.; dairy and collectors' lines, 7d. to 9½d. per pound.

Cheese.—S.A. factory, best, large to loaf, 6¼d. to 7¼d.; ordinary to fair 4d. to 5d. per pound.

Bacon.—Factory-cured sides, 6¾d. to 7¼d.; farm lots, 5½d. to 6¼d. per pound.

Hams.—S.A. factory, scarce, 7d. to 8½d. per pound.

Eggs—Loose, 10½d.; in casks, f.o.b., 1s. per dozen.

Lard.—In bladders, 5½d.; tins, 4½d. per pound.

Honey.—2¼d. to 2½d. for best extracted, in 60lb. tins; beeswax, 1s. per pound.

Almonds.—Soft shells, 4½d. to 5d.; kernels, 1s. 0½d. per pound.

Gum.—Best clear wattle, 2d. per pound.

Carcass Meat—Handy shop porkers, 4¾d. to 5¼d. per pound; good baconers, 4d. to 4½d.; heavy weights, 3¼d. to 3¾d.

Dressed Poultry—Turkeys, 5½d. to. 6¼d. per pound; fowls, 4¼d. to 5d.

Live Poultry.—Good table roosters, 1s. 4d. to 1s. 8d. each; medium, 1s. 1d. to 1s. 3d.; prime hens, 1s. 5d. to 1s. 7d.; poor to ordinary, mixed sexes, 11d. to 1s. 1d.; ducks, 1s. 9d. for small to 2s. 4d. for heavy; geese, 3s. 6d.; pigeons, 5½d.; turkeys, from 4d. for fattening sorts up to 6d. per pound live weight for good table birds.

MANGE ON HORSES.—Mr. W. Mewes, Emu Vale, Queensland, states that he has effectually cured mange on several of his horses by swabbing the affected places morning and evening with cold strained water in which potatoes had been boiled. Perhaps potato tops or tomato leaves boiled would be equally effective. The usual treatment is to wash the scabs off with warm strong soapsuds by aid of a brush, then dress the parts with a decoction made by boiling 1½ozs. tobacco in a quart of water. Repeat in fifteen days to kill second broods of mites. The stalls in stable, shafts of vehicles in which the horse has worked, the harness, saddle, and all places with which he has been in contact should be washed with carbolic soap or solution. Chloride of lime is useful with limewash for the stable when mange has been present. About 4ozs. to each gallon of limewash.

CENTRAL AGRICULTURAL BUREAU.

THURSDAY, JULY 20, 1899.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir S. Davenport, Hon. A. W. Sandford, M.L C., Messrs. S. Goode, W. C. Grasby, T. Hardy, J. Miller, M.P., T. Price, M.P., and A. Molineux (Secretary).

Potatoes.

The CHAIRMAN tabled samples of Silesia, Korn, Professor Maercker, and Thiele potatoes grown from setts imported by him from Germany. He also tabled report on experiments with fertilisers presented by Mr. F. H. Snow on behalf of the German Potash Works and the German-Austrian Thomas Phosphate Union, of which the following is a summary:—

EXPERIMENTS WITH POTATOES ON ONE-TWELFTH OF AN ACRE PLOTS.

Grower.	Plot 1.* Marketable Potatoes.	Plot 2.† Marketable Potatoes.	Plot 3.‡ Marketable Potatoes.	Plot 4.§ Marketable Potatoes.	Plot 5.‖ Marketable Potatoes.
	lbs.	lbs.	lbs.	lbs.	lbs.
(A) J. C. Ruwoldt, Mount Gambier, on nice volcanic soil	560	784	672	560	336
(B) H. Langrehr, Finniss, on black and red sandy soil	683	674	697	669	579
(C) H. Walters, Kalangadoo, on dark loamy soil	670	685	1,050	580	816

* Supplied with 4 lbs. Thomas phosphate and 16lbs. sulp. ammonia.
† Supplied with 48lbs. Thomas phosphate and 24lbs. muriate of petash.
‡ Supplied with 48lbs. Thomas phosphate, 24lbs. muriate of potash, and 16lbs sulp. ammonia
§ Supplied with 24lbs. muriate of potash and 16lbs. sulphate ammonia. ‖ Not manured.

Comparative Results, Calculated at per Acre.

Plot No. 1.—Cost of manure, £2 2s. 3d. (A) Increase, 24cwts.; (B) Increase, 11cwts. 16lbs.; (C) Decrease, 15cwts. 72lbs.

Plot No. 2.—Cost of manure, £2 19s. (A) Increase, 48cwts.; (B) Increase, 10cwts. 20lbs; (C) Decrease, 14cwts. 4lbs.

Plot No. 3.—Cost of manure, £3 18s. 6d. (A) Increase, 36cwts.; (B) Increase, 12cwts. 72lbs.; (C) Increase, 25cwts. 8lbs.

Plot No. 4.—Cost of manure, £2 15s. (A) Increase, 24cwts.; (B) Increase, 9cwts. 72lbs (C) Decrease, 25cwts. 32lbs.

Mr. Walters's plots were attacked by grubs, seriously affecting the returns.

Congress.

The SECRETARY reported that the Trades Hall Council Chamber, in Grote Street, had been engaged for the Congress meetings. The room was on the ground floor, easy of access, and near to the General Post Office. Several valuable papers had been promised.

It was decided that the Friday evening meeting should take the form of a conversazione, to which the members and their friends should be invited. Arrangements were left in the hands of a committee.

Phylloxera.

Mr. HARDY stated that the sub-committee appointed by the delegates from the various vine-growing centres had carefully considered the suggested amendments to the Phylloxera Bill and adopted all the desirable recommendations. The Bill was handed to the Minister about a week ago. He had seen the petition presented by the Tanunda German winegrowers. He had received a letter from Tanunda in which the writer said the ringleader of the oppositionists had advised the people to oppose any Bill, and many signatures had been obtained by false representations. A false report had been circulated to the effect that phylloxera was in Adelaide already, and that the vignerons in and around the city and in the South only wanted the poor men of Tanunda to pay them compensation; also that, although the rate was only 1s. an acre for the first year, it would before long be 5s. an acre; and that, as phylloxera would not grow in sand, the Tanunda district would, before long, have to pay for the whole colony. He was sure the petitioners could not understand the matter, or they would not make the opposition they had.

Mr. Price said that there was opposition to the Bill amongst the growers along the Torrens on account of the provision that in any proclaimed area all the fruit and vegetables were to be quarantined,

Mr. Hardy replied that the committee had taken this matter into serious consideration, and had so modified the clause as to meet the objections that had been raised. One of the chief objectors had expressed himself perfectly satisfied with the amended Bill As amended, the area quarantined would only extend two chains outside the infected area, and all fruit within the quarantined area would be paid for.

Extracts and Translations.

The Chairman tabled the following extracts and translations from Foreign Agronomical Papers:—

307. *Modiola decumbens.*—A forage plant. Is described by E. I. Wickson, Superintendent of Agricultural Grounds of the Experimental Station, at Berkeley, Cal. A native of Chili. Grows freely on all soils, even alkali lands, without irrigation. Sheep eat it freely and closely. It is as well fitted for horse feed as alfalfa. Cows eat it in preference and improve in flow of milk. Analysis showed it almost as rich in flesh-forming ingredients as alfalfa, and is in this respect superior to saltbush. It should be introduced with caution, because it has a habit of rooting from its prostrate stems and may be difficult to eradicate. It should be tried in places remote from cultivated lands.

308. *Schinus terebinthifolius.*—A new pepper tree from Brazil. Promises to be an acquisition to Southern California. It has broader leaflets than S. molle, and the appearance of the tree is good.

309. *Drought Resistance of Eucalypts.*—At Santa Monica Forestry Station, Southern California, with a temperature of from 42° to 88° F. and an average rainfall of 11·59in. the following observations were made with trees seven to eight years old. In the summer of 1896, with a rainfall of only 8½in., all the E. globulus (blue gum) and E. corynocalyx (sugar gum) stood the season well. Of E. panculata, 4 per cent.; of E. rostrata, 7 per cent.; of E. viminalis, 25 per cent.; and of E. cornuta, 40 per cent. succumbed. Some old E. marginata, E. magacarpa, E. gunni, and E. sidorophloia suffered badly and may not recover.

310. *Hibiscus sabdariffa*, or Roselle, is an annual which, sown after danger from frost is past, grows rapidly, resists considerable drought, and has a notable food value. Jam is made in Queensland from the husks and exported, or the juice makes the water an acidulous cooling drink. The husks may also be dried and exported.

311. *To Prevent Damage by Frost.*—Experience in California has shown that in order to guard against the damage that might be done by night-frosts it is necessary to provide a smoke considerably charged with moisture to act as a heat condenser and distributor, thus liberating its heat in the immediate atmosphere.

312. *Salt for Cattle.*—We do not enjoy our food if it does not contain some salt, and it stands to reason that, irrespective of experiments, cattle also demand more or less salt with their food. Most of our pastures will undoubtedly be found healthier if a sprinkling of salt is given at times, but it is of far greater importance for animals kept in stables or yards. Dairymen near town will soon find that their animals without receiving salt will show rough coats and that they do not look well nourished. It is, however, the reverse of advisable to mix the food once or twice a week with a strong dose of salt. A correct quantity is a daily dose of from one to three tablepoonfuls for milking cows, from three to four for cattle (according to their weight) that are to be fattened, and for calves proportionately less, from a quarter to one tablespoonful. It is recommended to give pigs from a quarter to three-quarters tablespoonful. As an experiment two bullocks received daily into each ration a quarter of a tablespoonful and another two no salt. After two months the first two (with otherwise the same food) weighed 30lbs. more.

313. *Goats* in some parts of the world serve the place of cows for the poor. They require little care, are satisfied with food rejected by other animals, and there is no fear of their milk transmitting tuberculosis, so that it can be used without the necessity of boiling. Lately it has been stated by eminent authorities that boiled milk is not nourishing for children Consumers soon become accustomed to the peculiar taste of goats' milk. In Southern European countries, especially in Italy, large herds of goats are daily driven from the pasture into the towns and villages to be milked at certain places and there immediately sold to the consumer. Generally goats can only be kept in numbers under a herdsman so as to prevent injury to crops. The improvement in the breeds is mainly due to Switzerland, for there you may find goats that give four times as much milk as a common goat. Lately some societies have been formed in Germany for the improvement of the race, and distribution of these has gone on in large numbers. The flesh of young goats is also much used and sought for, and the skins command quite 2s. for the purpose of making gloves.

New Branches.

Applications for permission to form Branches of the Bureau at Wilson, in the north, and Bakara, east of the Murray, were approved on condition that sufficient gentlemen practically connected with agricultural pursuits would join the proposed Branches.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Minlaton, Mr. J. D. Mayer; Riverton, Mr. M. Nash; Watervale, Messrs. B. Perrin and C. Castine; Port Elliot, Mr. J. R Coote; Wandearah, Messrs. M. Roberts and W. Davidson; Woodside, Mr. W. Drogemuller; Bute, Mr. A. Sharman; Burra, Mr. Thos. Sandland; Holder, Mr. C. H. Perry; Mallala, Messrs. B. Cowan, A. M. Wilcox, Jas. McCabe, and Jno. Jenkins; Port Pirie, Mr. J. D. Wright; Cherry Gardens, Mr. A. Broadbent; Gumeracha, Messrs. N. G. Kramer and A. E. Lee.

Reports by Branches.

The Secretary reported receipt, since previous meeting, of seventy-three reports of Branch meetings.

REPORTS BY BRANCHES.

Boothby, June 28.

Present—Messrs. J. T. White (Chairman), G. T. Way, J. R. Way, R. Chaplin, J. Bell, H. G. Evans, R. Carn, T. Robinson, R. M. B. White (Hon Sec.), and one visitor.

Feeding Horses.—Mr. Evans read a short paper on "Rational Feeding of Horses." His remarks were intended to apply specially to farm horses at feeding time, but would also apply to almost any class. Horses like a change of food, but the change must not be too great. If brought in from grass, they should be fed once or twice daily for a week or more before putting them to work. He preferred long hay the first three or four days, then give an occasional feed of shorts, but not too rich for a start. Give about 4ozs. of boiled linseed in their feed three times a week while working them. A little treacle mixed with the food is also beneficial. A good course of feeding is boiled wheat mixed with bran and chaff for breakfeast and dinner; soaked wheat and copra cake, with bran and chaff, in the evening, to finish up with good clean hay at night. If green feed is given, do not give it directly it is cut, or while wet with dew, as it will probably cause colic. He considered it best to give green feed in the evening. Do not forget to keep a lump of rock salt in the crib. To soak the wheat and copra cake, put in a barrel a layer of wheat, then copra cake, then another layer of wheat; just cover with hot or cold water, and after allowing it to stand for a few hours turn it over with a shovel.

WATER SUPPLY.—A visitor called attention to bad condition of the tanks on the Port Lincoln track, and it was decided to bring the matter under the attention of the proper authorities.

MANGE.—Mr Way asked for remedy for mange in horses. Mr. Evans advised application of kerosine. [It is not advisable to apply kerosine. The parts affected should be well rubbed with a good lather of softsoap and carbolic, and then washed and dressed with carbolic oil. A bran mash with 2ozs. or 3ozs. salts will probably be beneficial. If the animal is constipated a purgative should be given —GEN. SEC.].

WHEAT —Mr. Wheeler said he was of opinion that Beincke's Monarch wheat would be very largely grown in the future. It was as early as Steinwedel and did not shake out. Members agreed that mixing certain varieties together for sowing was a good practice. Steinwedel and Bearded and Purple Straw and Rattling Jack did well together.

CARE OF IMPLEMENTS.—Mr Carn said all implements should be cleaned after being used, as the blacksmith always charged when repairing for cleaning off the grease, &c.; and sometimes this cost really more than the actual repairs.

FORESTRY.—It was resolved to ask the Central Bureau whether the Government would distribute seeds of forest trees to farmers in out of the way districts, where distance from the nurseries prevented them from obtaining trees from the Forest Department.

Port Germein, July 1.

Present – Messrs. G. Stone (Chairman), W. Head, A. Thomson, W. Crittenden, W. Mortess, E. McHugh, J. K. Deer, H. H. Glasson, D. Thomson, W. Broadbear, and A. H. Thomas (Hon. Sec.).

TUBERCULOSIS.—Members consider that when an animal suspected to be affected by tuberculosis is slaughtered and is found to be free of that disease, the owner should be compensated.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected. Mr. J. K. Deer was elected Vice-chairman.

RAINFALL.—For June, 2·50in.; for half-year, 8in.

Forest Range, June 22.

Present—Messrs. J. Green (Chairman), S. A. Collins, A. Green, R. Hackett, C. Stafford, J. G. Rogers, J. Caldwell (Hon. Sec.), and one visitor.

CODLIN MOTH REGULATIONS.—Mr. Hackett initiated discussion on this subject. The main objection to the regulations was that one man was allowed to sell his infested apples in the market and went free, while another would be prosecuted for trying to sell such fruit. [This is not correct. No one is *allowed* to sell infested apples, but it is not always possible to catch the offenders.—GEN. SEC.] The regulations in regard to spraying were very vague, and if enforced would entail great hardship and do little good. Then the clause compelling all rough bark to be scraped from the trees should read "loose" bark. He thought the regulations unnecessary, as if action was left to the common sense of the growers it would be to their interest to do all they could to keep down the pest. Mr. A. Green said the inspectors were just as likely to catch one man as another selling infested fruit, though it was no doubt true that many escaped detection. It was also impossible for the few inspectors to properly attend to their districts. The question of scraping off the bark might well be left to the growers. He had found that the best way to keep down the pest was to go over all the trees carefully and pick off all infested fruit. Mr. Collins agreed that more inspectors were necessary if the inspection of orchards was to be effectively carried out. He did not favor spraying, and thought bandaging the trees and searching for the caterpillars on the trees was the best way of keeping down the pest. Owing to the rough weather the attendance was poor, and further discussion was adjourned till next meeting.

Cradock, June 24.

Present—Messrs. R. Ruddock (Chairman), P. Gillick, R. Solly, W. Haggerty, P. O'Dea, and J. H. Iredell.

OFFICERS.—Messrs. R. Ruddock, Jas. Clark, and J. H. Lindo were re-elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the past year nine meetings were held, with an average attendance of eight members and two visitors. Four practical papers had been read and numerous matters of interest discussed. The drought had seriously affected the working of the Branch, but increased interest was being manifested in the work, and with the splendid rain during the past few weeks things were looking more promising.

ARTICHOKES AS FODDER.—Mr. Solly supplied small quantity of seed of the common artichoke, and reported that it made useful feed for horses, sheep, or cattle.

WATERING HORSES.—A discussion took place on the watering of horses when heated. Mr. Gillick said they should be allowed to cool down before having a drink, or be driven a short distance after drinking. Other members agreed.

THATCHING.—The Chairman stated that while travelling in another district he had noticed what appeared to be an easy method of thatching stacks, sheds, etc. Pegs about 18in. long were fixed along the eaves, and loose straw piled on to a depth of 12in. to 18in.; the pegs kept the straw from being blown off. [Unless cords or wires are run from peg to peg across the straw it is difficult to see how the straw is to remain in position.—GEN. SEC.]

Appila-Yarrowie, June 23.

Present—Messrs. J. O'Connell (Chairman), J. C. W. Keller, J. Daly, W. Francis, E. Catford, and C. G. F. Bauer (Hon. Sec.).

POULTRY.—Mr. J. O'Connell spoke on "Poultry." He said farmers, as a rule, but with a few exceptions, neglect the minor products. In regard to sheep they would never think of mixing several classes together for breeding purposes, but on most of our farms nearly every breed of fowls and mongrels will be found running together. For sheep and other live stock nothing but the purest stud animals are considered good enough, but anything with feathers will do for the poultry yard. An American authority says that the different breeds of fowls produce eggs annually on the following averages:—Brown Leghorn, 200; Minorca, Andalusian, Hamburg, 180; Plymouth Rock, Orpington, 170; Langshan, 160; Cochin, Indian Game, 120. Last year South Australia exported only 180 fowls to England, but there should have been as many hundreds of crates of fowls sent away. This colony is well suited for poultry raising, and if farmers propose to breed for export to England they must rear only the highest quality table fowls, with full breasts and thighs and white meat. For his own purposes he favored the Langshan, because it lays during the winter time, does not fly on sheds, stacks, &c ; is a good table fowl, and is strong and healthy. Whether for table or for egg-production only the best pure breeds will pay to keep.

SHEEP-BREEDING.—Mr. Catford questioned whether cross-breeding with Merino ewes would affect the progeny later on when sired by Merino rams. Members were of the opinion that no effect would be visible in the latter progeny.

Norton's Summit, July 1.

Present—Messrs. John Jennings (Chairman), J. Hank, A. Smith, J. J. Bishop, and W. H. Osborne (Hon. Sec.).

PEACH CURL-LEAF.—Members wished to draw the attention of the General Secretary to bulletin on Prunicolous exoasceæ by Professor Atkinson, in which it states—"Some experiments have been made in various places by spraying the trees with Bordeaux mixture for the prevention of leaf-curl of peach trees. Some of the experimenters regard it as certain that the disease can, to some extent, be checked by this method. It is quite likely that, in some cases at least, another disease is confused with curl-leaf, and this fact might account in those instances for the results claimed. More definite experiments, with an accurate determination of the diseases present, should be made before too much can be claimed for the efficacy of the application of sprays for the prevention of this trouble." Professor Atkinson also gives an account of attempts to inoculate healthy trees with the disease, but in no case does he know of any attempt being successful. [In Barossa district, wherever spraying with Bordeaux mixture has been properly done, the peach curl-leaf, the apple "scab," the pear "scab," and the shothole fungus have been largely and *most successfully* combated.—GEN. SEC.]

STRAWBERRY CULTIVATION.—Members would be glad to have information as to the cross-fertilisation of the flowers of the strawberry, and to the difference between the pistillate and bisexual varieties.

Renmark, June 22.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, Rice Kelly, E. Hutton, M. Chapman, R. V. Bostock, E. Taylor (Hon. Sec.), and one visitor.

THE APRICOT.—Mr. Hutton read a paper on the "Cultivation of the Moorpark Apricot," as follows:—

To be successful in the production of this fruit, we must adapt our procedure to the conditions found here, viz., climate, soil, irrigation, and intense culture; therefore a special system of pruning is absolutely necessary, and probably would be most unsuitable in some other parts. First, let us picture an altogether perfect type of tree, stout base and stocky throughout, every limb carrying an equal share of fruit, no overcrowding, but any part of the tree easy of access. Head round, sides standing well up, bark firm and healthy color, fruit wood and spurs capable of carrying large fruit, sheltered from the sun and able to resist strong wind, appearing in shape as a V outline, suitable for close cultivation. Such a tree will be economical in all respects, and profitable to the grower. Variety should be the Moorpark budded on seedling apricot stock, being a steady upright grower, the fruit of excellent quality, and firmer on the tree in a state of ripeness. To attain this perfect type of tree, I make the following recommendations:—Land best suited is a deep strong soil, good drainage and free of alkali, well graded and marked out on the septuple not less than 20ft. apart. It must be well worked up and the holes dug in the surface soil only. Planting months, July and August. Trim off all damaged roots ; plant about 1in. above nursery mark, and when placing the tree in the hole spread roots and press the earth lightly round them. Water ; apply immediately if season is dry. Head back to 9in. above the bud, leaving a stock in all 12in. high ; also remove any laterals; keep the ground well hoed up to the trees and the land clear of weeds and cultivated. Summer pruning, month November. This work may be greatly reduced by going round as soon as the shoots are 6in. long and rubbing off side growth, thinning out, and pinching back. Where the growth is very vigorous, making the tree top-heavy, first season shorten in to 9in., future seasons leaving the growth longer, always attending to the symmetry of the tree Laterals on the trunk, cut back to 2in., as they are most valuable in protecting against sunburn. Topping, in summer, after the first two years will be found unnecessary, with the exception of keeping the side shoots rubbed off and thinning out were practicable. Winter pruning; leading branches cut back to 9in. or 12in., thinning out that there may be a space of 12in. between any two of them; no overcrowding, leaving easy approach to the centre of the tree. Fruit wood and spurs cut back to 8in. and 6in. respectively, thin out that the fruit has room to develop. Sunburnt or weak wood always cut severely to restore vigor; this most often is the outcome of careless pruning, leaving wood too long and exposed, or summer pruning, where the trees were not strong enough to stand it. Keep tne sides of the tree well pruned up, and trim off all fruit spurs that are liable to be brushed by the horse and cultivator. From the commencement we must be systematic, and bear in mind what is most desirable to be aimed at, and then we shall avoid many annoyances and the removal of large wood, which is most detrimental to the health of the tree.

A question was asked whether bonedust or super should be applied to young apricot trees. [The answer depends entirely upon the condition of soil. If phosphoric acid is deficient, a mixture of both should be given. When fruiting, it may be beneficial to apply potassic fertilisers, and even nitrogenous manures.—GEN. SEC.]

Dowlingville, June 23.

Present—Messrs. R. A. Montgomery (Chairman), T. Kenny, T. Illman, Theo. Lombladt, F. W. Roberts (Hon. Sec.), and three visitors.

SEED DRILLS.—A discussion took place on this subject, members being of opinion that the wheat-feeders were not as near perfect as they might be, as they often caused damage to the drill or crushed the wheat.

DEEP PLOUGHING.—Mr. Lombladt said some years ago one of his paddocks was very hard; consequently he ploughed it deep and got a good crop, but since then he had never been able to grow a crop on it. The Hon. Secretary said he ploughed some grey land about 4in. deep, and had not grown a crop of wheat since, though grey oats did fairly well.

Bute, June 20.

Present—Messrs. W. H. Sharman (Chairman), M. Stevens, J. H. Barnes, W. Hamdorf, E. Ebsary, R. Commons, and M. Hall (Hon. Sec.).

FODDER.—Members consider that barley is the best crop to grow as fodder in this district, as it grows more quickly than anything else.

OFFICERS.—The office-bearers for past year were thanked and re-elected.

Mundoora, June 23.

Present—Messrs. J. Blake (Chairman), W. H. Mitchell, J. J. Vanstone, W. Aitchison, G. Haines, and A. E. Gardiner (Hon. Sec.).

PERMANENT RELIEF FUND.—After considerable discussion the following resolution was adopted:—"That this Branch is opposed to the establishment of a permanent relief fund for farmers, as we consider it unadvisable to endeavor to keep farmers on land which has proved so unsuitable for agricultural pursuits, and we believe that relief will be afforded when required, as it has been in the past."

"Our Native Birds and Their Uses."—Mr. Vanstone introduced a discussion upon this subject. A great decrease in the numbers of our native birds is apparent, and something must be done to prevent the wholesale slaughter. School children should be discouraged in robbing birds' nests, trying to keep pet birds which almost invariably die, and school teachers should discountenance the making of "collections" of eggs in competitions for prizes. The subject generally ought to seriously occupy the attention of the School Boards of Advice and the Education Department. He mentioned where one family was taught to love the native birds, and the children were very careful to see that they had plenty of water during the hot weather. If care is not soon taken to protect the birds, the whole country will become overrun with pests, as on parts of Yorke's Peninsula, where hundreds of acres of wheat and grass were annually destroyed by the grub of a species of cockchafer. Mr. Blake read a paper which been prepared by a leading member of the Bureau and sent on to the Branch. He (Mr. Blake) agreed with all that was stated in that paper, except with respect to the crows; but for the future they will receive more consideration at his hands. The magpie should in no case be destroyed. Mr. Blake concurred, and was pleased to learn that the crows are of some use. Their bad habit of pecking out the eyes of lambs and stealing eggs has brought them into much disfavor, but if the matter of bird protection is taken in hand by the Education Department even the trespasses by the crows will be forgiven. Mr. Mitchell had noticed the crows destroying a few lambs (perhaps many of them were stillborn), but this occurred only during a few weeks, and the remainder of the year they are in the fields. Egg-stealing is carried on mostly when the crows are nesting. He was anxious to have something done to protect our native birds. Mr. Aitchison was of opinion that much of the decrease of our native birds was due to the destruction of our natural forests. Our limited forest areas and the small clumps of trees that were left on farms ought to be most carefully maintained, and increased as rapidly as possible. Very many birds die from the want of water during the hot weather, but as far as he could he would endeavor to provide water for them on his property. Parrots had destroyed some of his corn and fruit, but they are very beautiful, and become quite tame if unmolested. He would not like to see them molested. Mr. A. E. Gardiner was much pleased to notice the movement for protection of our useful native birds. In September, 1898, a large flock of crows daily visited one of their paddocks, and upon examination a great number of large caterpillars was seen, but the crows apparently cleared them off, as no damage resulted. Mr. Haines said that if the magpies are allowed to build their nests near the homestead they will prevent the crows stealing the hens eggs by mobbing and driving the crows away. Such had been the result at his place.

Narridy, June 17.

Present—Messrs. A. Bairstow (Chairman), H. Nicholls, R. Satchell, A. McDonald, W. Martin, and Jas. Darley (Hon. Sec.).

Permanent Relief Fund.—Mr. Martin favored the establishment of a permanent relief fund for all farmers requiring assistance. Messrs. Nicholls, McDonald, Satchell, and Bairstow were opposed to the scheme. They were prepared to assist in cases of distress, but thought that it would be a mistake to try and keep farmers on permanently drought-stricken country. Perhaps the lessons from the past would teach some farmers to save fodder during favorable seasons. It would be desirable that some of the large estates in the favored districts should be purchased, and that farmers on the drought-stricken country should be located where there was a possibility of getting a living.

Arthurton, June 23.

Present—Messrs. W. Short (Chairman), T. B. Wicks, W. H. Hawke, J. Pearson, M. Lomman, J. Koch, M. Baldock, H. Baldock, C. L. Palm, J. B. Rowe (Hon. Sec.), and seven visitors.

FARMERS' RELIEF FUND.—This subject was discussed and a proposition to the effect that a permanent relief fund was undesirable and that it would be better to help those settled in the dry areas to settle where the rainfall was better was carried.

STANDARD BUSHEL.—Several members expressed dissatisfaction at the present system of fixing the weight of the standard bushel, and it was resolved that it would be to the best interests of all concerned if a fixed standard of not less than 63lbs. was adopted with proportionate reduction or addition to price for all samples under or over the standard. This would induce farmers to produce as high a grade as possible.

POTATOES.—Mr. Hawke said he considered that in cutting potatoes for planting the ends with the clusters of eyes should be put aside to plant to produce seed for the next season. The other setts should be cut to contain two eyes. They should be covered about 4in.

RAINFALL recorded at Winulta for quarter ending June 30, 5·34in.; at Tiparra 6·34in.

Holder, July 1.

Present—Messrs F. A. Grant (Chairman), E. Crocker, H. Blizard, W. Watt, J. Rowe, J. E. Trimming, J. Maddocks, J. Rossiter, F. G. Rogers, J. Green, J. J. Odgers (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary read his annual report. Thirteen ordinary and one special meetings had been holden, and the average attendance was nine; two original papers had been read and discussed, and discussions had taken place upon various other matters. One homestead had been visited. Three members had promised to provide papers, but had failed to do so. It was matter for complaint that members do not arrive at conclusions upon matters brought before them. A project for a combined River Branches Show had fallen through. Members were urged to be more diligent in attendance and more earnest in the work of the Branch in future.

POTATOES.—Members consider that potatoes can be planted at the latter end of August if there are no late night frosts.

OFFICERS.—Chairman and Hon. Secretary were thanked and re-elected.

Richman's Creek, June 25.

Present—Messrs. A. Knauerhase (Chairman), J. M. Kelly, E. Roberts, J. J. Searle, A. Nicholson, F. Mattner, J. McColl (Hon. Sec.), and three visitors.

BEES AND HONEY.—Mr. Kelly read the following paper, illustrated with bar-framed hive, combs, honey, &c.:—

Bees.—In a good colony or hive of bees there are to be found three sorts—first, the queen or mother bee, who is the most important, because she is in reality the mother of all the others in the hive; second, the worker bee who while young takes care of the brood and does the inside work of the hive, and when older goes out into the fields and gathers honey, pollen, propolis (or bee glue), and water for the need of the colony; third, the drones. These are larger bees than the worker, and they do a great deal of buzzing about and are very noisy, but there is no danger in handling them as they do not sting; their sole function is to fertilise the young queens or virgin females, for as soon as the honey is getting scarce the worker drives them out of the hive. There are, I believe, only two sorts of bees kept in Australia, the black bee and Italian or Ligurian bee. The bees I have are hybrids, a cross between the black bee and Italian bee; and, as far as my experience goes and from what I have heard and read, they collect as much honey as the high-priced Italian. I am told the Italian is a better bee, as they defend their hive better than black or hybrids from the attack of the bee moth and ants. Any person starting bee-keeping should start in a small way - one or two hives at the most—there are so many things to learn and so many mistakes can be made. When I got my first swarm I brought them eighteen miles in a cart. Of course when loading them I trusted to the seller to tell me how to get them home safely, but when I looked into the hive next day I found nearly half my bees dead, and in a month more there were very few bees left in the hive. Luckily a gentleman who understood bees looked in the hive and said "You have no queen, and she must have been away a long time as there is no brood in the hive." I then told him how I brought them home, and he at once showed me where I made a mistake in not fastening the frame at the bottom, and the jarring had killed the queen too. I daresay if I had not had anyone to tell me what to do my bee-keeping would have ended there at once, but in a tree close to where I live was a swarm, and this person got the swarm and put them into the hive, queen and all, and I have had bees ever since.

Honey.—History does not mention the first discovery of honey by human beings, whether it became known to primitive man by accident or by the splitting of a tree in which bees had stored honey, or by observation of the fondness of some animals for it; but certain it is that when he tasted the thick transparent fluid the fear of stings was overcome and the bee-hunter was born. Since that time the manner of securing honey has undergone many changes; bees are not brimstoned and the whole colony lost for the sake of the honey. What with the Langstroth hive, the movable frames, and the extractor, a bee-keeper gets the honey and does not lose any bees. Persons who raise just enough honey for their own use I would advise to try comb or section honey. From what we read it appears honey is very much adulterated when in the liquid state, but no one yet has been able to manufacture and adulterate comb honey. The want of flavor and consistency is by far in too large a quantity of the liquid honey sold, so unlike the genuine article people occasionally have had the pleasure of tasting, that it has caused consumers to vote it as not worth putting on the table, little dreaming that the article they have been buying and using "is not what it should be" Honey is not used in Australia to the same extent it is in older countries, and I believe this is attributable to the class of honey sold. Honey at one time was considered to be an absolute necessity as an article of food, but the advantages of a honey diet are less understood with us than our forefathers We have too many substitutes for honey now to what they had. Syrup under all sorts of names, treacles, molasses, and sugar entering into all kinds of sweet food compounds. Professor Hashbuck says in an article a short time ago—"Besides being a delicious and wholesome article of food, I consider comb honey a specific cure for many difficulties of digestion and irregularities of the bowels. I assure all persons whose digestion needs a little assistance that they will find comb honey, eating wax and all, just the thing to help them. The flakes of wax furnish a gentle stimulus to the digestive membrane without in any way injuring them"

In carrying a vote of thanks it was mentioned that there were several places in the district where a few hives might be kept with advantage.

Rainfall.—By Mr. Freebairn—April, 0·42in.; May, 0·30in.; June, 3·44in. By Messrs. A. and J. McColl—April, 0·93in.; May, 1·03in.; June, 3·26in.

Lucindale, June 24.

Present.—Messrs. A. Dow (in chair), G. C. Newman, A. Lobban, A Matheson, E. E. Dutton (Hon. Sec.), and one visitor.

Potato Experiments.—The following report from Mr. E. Feuerheerdt on new varieties of potatoes imported by Mr. Krichauff and sent up for experiment, December, 1897, was tabled:—Soil in which the potatoes were planted, of a light sandy nature, rather dry; manured with farmyard manure and ashes, and irrigated one week before planting, also irrigated several times during growth; planted on January 17, and dug on June 8, 1899. Nos. 4, 5, 6, and 12 ripened about ten days before the other varieties. No. 3, Wohltmann—Seeds made into fourteen sets, yield, 13¼lbs.; a very good variety, shapely, and of a deep pink color; potatoes set away from the stem. No. 4, Korn—Six sets, of which two failed; yield, 4lbs.; not many on the plants, but good; very shapely. No. 5, Eyth—Eight sets, of which two failed; yield, 11lbs.; good and very even in size. No. 6, Professor Maercker—Twelve sets, of which one failed;

yield, 22lbs. ; this is the best of all, the potatoes grow close to the set, are very easily dug ; very even in size, large and shapely. No. 7, Thiel—Twelve sets, of which one failed ; yield, 19¼lbs. ; similar in growth to No. 6 ; a very fine potato and next best to No. 6. No. 10, Gratia—Sixteen sets, of which one failed ; yield, 24½lbs. ; this is a very good variety, red, fairly even in size, but sets away from the stem very much. No. 12, Ehlers—Six sets, of which three failed ; yield, 6lbs. ; very even in size, and a very nice potato. Total yield from 7lbs. seed, 100lbs.

Bonedust.—Mr. Newman tabled sample of bonedust purchased in the South-East which was considered to be of inferior quality.

Membership.—It was decided that members absent for three consecutive meetings be advised that their seats will be declared vacant.

Mylor, July 8.

Present—Messrs. W. Nicholls (Chairman), F. G. Wilson, E. Wilson, F. Rosser, T. J. Mundy, E. J. Oinn, W. H. Hughes, S. W. Jackman, W. T. Elliott, W. G. Clough (Hon. Sec.), and eighteen visitors.

Co-operation.—Mr. E. Wilson was thanked for reading a paper on "Co-operation," and a sub-committee of eight was appointed to inquire into the subject, and report upon the principles and feasibility of establishing co-operation amongst cultivators, &c.

Annual Report.—The Hon. Secretary read the annual report, which showed that ten meetings had been holden during the year, at which the average attendance had been over ten members and eight visitors, with increasing interest and usefulness. Only fourteen samples of products had been tabled, against seventy-nine last year. These exhibits are regarded as of great educational value, and should be encouraged. Six practical papers had been read by members and friends. Seeds of vegetables and fodder plants had been distributed, but reports were not very favorable. The Hills Branches Conference at Mylor, on October 25, was highly successful, and the visit to the Government typical orchard was instructive to all. Mr. W. C. Grasby's lecture, with limelight views, in the evening was much appreciated. Prince's Lad, a pure-bred Jersey bull, has been stationed at Mylor by the Hon. Minister of Agriculture, and a cow club has been started upon the principles advocated by Mr. E. Wilson, Inspector of Homestead Blocks.

Cow Club.—The cow club was started on May 13, with thirteen members; and on July 9, with twenty-five members, the first draw of £6 was made. There will be a draw once a month when the members number thirty. The cows are purchased by an inspector appointed by the members of the club. Provision is made in the rules for many contingencies that may arise, and the cows all belong to the club (although used by the lucky "drawers") until each member has obtained his animal.

Bowhill, June 24.

Present.—Messrs. J. G. Whitfield (Chairman), E. Weyland, J. MacGlashan, C. Drogemuller, J. Waters, W. G. F. Plummer, A. Dohnt, and H. F. Plummer (Hon. Sec.).

Tagosaste.—Mr. Drogemuller reported that the seeds of Cytisus palmensis (the true Tagosaste) did not germinate, although he gave them a plentiful supply of water. Mr. Waters showed branches of "tree lucern" (Cytisus proliferus, miscalled "tagosaste" by many people), which resulted some years ago from seed procured from Angaston. This was proof that this plant will thrive in the district.

WHEATS.—Mr. Drogemuller showed samples of Steinwedel and Gravestock's Frampton wheats. Although there is no perceptible difference in the straw there is a notable difference in the heads

SEASONABLE WORK.—Mr. C. Drogemuller recommended that land should now be prepared for sowing of mangolds, melons, cucumbers, beans, &c. Transplant onions, cabbages, &c. Plant potatoes and hoe existing crops. Mr. Plummer thought that on the farm stumps should now be carted off cultivated fields, bushes cut, repair fences and machinery and implements.

Davenport, June 30.

PRESENT.—Messrs. W. J. Trenbath (Chairman), J. Lecky, A. McDonald, T. McDowell, and J. Roberts (Hon. Sec.).

TUBERCULOSIS.—In discussing the paper by the Chief Inspector of Stock members were of opinion that the suggestion that owners of cattle affected with tuberculosis could "either *fatten* and kill them" requires explanation. If there were a chance of recovery from the disease then it would appear that undue haste and little consideration for owners would be shown by insisting on immediate destruction when the presence of disease was discovered by the inspectors.

Caltowie, June 26.

PRESENT.—Messrs. J. G. Lehmann (Chairman), G. Petatz, J. Potter, J. Neate, and A. McDonald.

OFFICERS.—The election of officers for ensuing year resulted as follows:—Chairman, Mr. J. G. Lehmann; Vice-chairman, Mr. J. Neate; Hon. Secretary, Mr. A. McDonald. Other business of formal nature was transacted.

Port Pirie, June 23.

Present—Messrs. P. J. Spain (Chairman), W. K. Mallyon, E. J. Hector, A. Wilson, T. Gambrell, W. Smith, H. B. Welch, G. M. Wright, G. Hannam, J. Lawrie, W. Wood, and R. J. Ferry (Hon. Sec.).

THE WATER QUESTION.—Members were unanimous in the opinion that residents should be required to pay only for the quantity of water used in each instance.

Penola, July 8.

Present—Messrs. J. Fowler (Chairman), D. McKay, D. Balnaves, W. Miller, A. E. Stoney, J. T. Morris, E. McBain, H. Ricketts, Dr. F. Ockley, and R. Fowler (Hon. Sec.).

RAINFALL.—Mr. A. E. Stoney reported rainfall at Coonawarra for June, 5·22in. At Penola for May it had been reported as 1·83in.; at Naracoorte, 3·50in.; at Mount Gambier, 3·50in.; and at Coonawarra, 2·31in.

VISIT BY THE HON. MINISTER OF AGRICULTURE.—The Hon. Secretary reported that since the latest meeting the district had been visited by the Hon. Minister of Agriculture, and a fairly well attended meeting had been held at Coonawarra Fruit Colony, where the codlin moth and phylloxera questions were placed under the notice of the Hon. Minister. The Hon. Minister congratulated the fruit colonists upon the good state of their orchards, and upon the success, so far, in preventing the introduction of the codlin moth. The suggestions made by the various speakers would receive earnest consideration, and effect would at once be given to one recommendation. A cordial vote of thanks was given to Mr. J. A. Riddoch, who provided vehicles for conveyance of the visitors to the fruit colony, and also entertained them at Katnook and Yallum.

BOARD OF CONTROL.—Resolved—That the Hon. Secretary take the initial steps to find out the wishes of the fruitgrowers of the district *re* the appointment of a board to control matters relating to pests, &c., &c.

EXHIBITS.—Mr. J. T. Morris tabled a large specimen of saltbush grown on Penola Station. If grown from seeds progress is very slow, and it is better to grow saltbush varieties from cuttings from 5in. to 7in. long at 4ft to 5ft. apart. Mr. Ricketts tabled two varieties of barley for identification, and wished to know which is the best way to thrash barley for malting. [Roll it out or tread with bullocks or horses.—GEN. SEC.]

Murray Bridge, July 8.

Present—Messrs. F. H. Wurm (Chairman), W. Lehmann, J. J. Stecker, B. Jaensch, W. F. Wundersitz, J. G. Neumann, R. Edwards (Hon. Sec.), and one visitor.

OFFICERS.—The office-bearers were thanked and re-elected.

"HOW TO PREPARE TIMBER LAND FOR CULTIVATION."—Mr. W. F. Wundersitz read the following paper:—

With good mallee scrub it is usual to cut the trees close to the ground. This is usually found on deep clay soils. Light mallee scrub is generally broken down with heavy rollers. Two men with four or five horses can roll down six or seven acres per day, but the work is not as nearly well done as with the axe, because some of the wood breaks off too high and must be chopped down afterwards. If this is not done the field will be very troublesome to work with the stump-jumping ploughs and harrows, and still more difficult for the reapers and binders or mowers. Rolling, too, leaves a lot of green scrub which must be cut with the axe before the fire has gone through, else there will be a lot of rubbish left to be gathered and burned in heaps. Rolling or cutting should always be done during the winter, not later than September and burning about March, to prevent shoots growing before winter, which will happen if burned much earlier, and they will give trouble when reaping. On poor or stony pine lands it is best to cut level with the ground, but the trees should be grubbed on the deep-soiled pine lands if possible. All good timber suitable for posts, building, firewood, &c., should be cut into suitable lengths, piled in heaps, and covered with straw to protect it. Pines for building, &c., should be cut and barked during summer, put in a shed or covered until dry, else the wood is liable to crack. Mallee wood comes in very usefully for rails, sheep hurdles, and many other purposes.

Mount Gambier, July 8.

Present—Messrs. J. Umpherston (Chairman), G. G. Collins, J. C. Ruwoldt, J. Dyke, W. Mitchell, T. H. Williams, W. Barrows, D. Norman, sen., M. C. Wilson, and E. Lewis (Hon. Sec.).

CODLIN MOTH REGULATIONS.—Penola Branch wrote asking co-operation in protest against repeal of legislation dealing with the codlin moth. Some discussion ensued, and it was pointed out that the agitation in favor of the repeal of the regulations was directly principally against the clause prohibiting the sale of infested fruit. Members agreed that the regulations should be modified in some respects, but not in regard to the sale of fruit. It was decided to support the Penola Branch, and to suggest that there should be modifications in the regulations to suit certain localities. Mr. M. C. Wilson tabled specimen of "night jar," a small grey bird which lived to a very large extent upon insects, and said if such birds were protected and their increase promoted there would not be so much trouble with codlin moth and other insects. Mr. Williams said codlin moth was found in two gardens at Naracoorte, but had not spread at all, the affected fruit being all carefully gathered and destroyed.

Potatoes.—Mr. Ruwoldt produced twelve small potatoes, all different sorts, grown by him from seed supplied to him by the Chairman of the Central Bureau, and read the following brief description of the potatoes:—No. 1, Hero —Light red potato, flat eyes, late. No. 2, Silesia—White potato, good size, equal form. No. 3, Wohltmann—Red, prolific, rather late. No. 4, Wilhelm Korn—White, flat, middle early. No. 5, Max Eyth, or World's Wonder—Light red, white marks. No. 6, Prof. Maercker—White, prolific, unsuitable for heavy soil. No. 7, Thiel—White, late. No. 8, Sirius—Large white, late. No. 9, Pluto—Red, round, prolific. No. 10, Gratia—Dark red. No. 11, Cygnea—White, large, prolific. No. 12, Ehlers—White, small. These potatoes were planted on January 11, 1899, and dug in the first week of May, 1899. They did not grow with him as well as they should have done. The time of year was against them. He had to water them all the time they were growing, and they got frosted too. Other members stated that they had been or were now trying new varieties of potatoes, some imported, others raised from seeds from Brown Rivers potato. It was pointed out that from seed the potatoes required several years cultivation before it could be known whether they would be of value, while imported setts would require to be acclimatised.

Officers.—Messrs. J. Umpherston and E. Lewis were re-appointed Chairman and Hon. Secretary, and Mr. J. Watson was appointed Vice-president. The Chairman paid special tribute to the value of the services rendered by the Hon. Secretary.

Smut in Oats.—The head teacher Square-Mile school asked for information as to hot water treatment for smut in oats. Members were in doubt on this point, as oats were usually sown without treatment. Bluestone pickle as for wheat, or treatment with hot water 120° F. to 130° F., was recommended.

Morphett Vale, July 5.

Present.—Messrs. J. Bain (Chairman), J. McLeod, F. Hutchinson, A. Jones, A. Perry, J. Depledge, A. Pocock, and A. Ross Reid (Hon. Sec.).

Management of Farm Horses.—A paper prepared by Mr. Christie was read to the following effect:—

Breeding.—After a tribute to the nobility and usefulness of the horse and condemnation of bad treatment, he thought every farmer should keep one or two brood mares. He preferred moderately heavy Clydesdales, which must be sound and free from hereditary blemish, not too young—say four years—else the mare may be injured and the foal a weakling. Neither should the mare be too old, which may result in foals lacking in spirit and vigor. The stallion must be the very best available. When the farmer knows the tempers and dispositions of his mares he can raise colts that will be docile and easy to handle and break. With care the mares can be employed on steady farm work up to within a few weeks of foaling. They are more liable to slip their foals when about half their time has gone. Before foaling mares should be kept in a paddock separate from all other horses, and should be seen daily, but left undisturbed as much as possible, especially when actually foaling, as the mare may then suddenly rise and cause navicular rupture. Of course if the parturition is unduly extended something is wrong, and the mare must then be approached and attended to. When the foal is dropped place the mare and foal in the best paddock, as this will give the foal a good foundation.

Housing.—This is of the greatest importance. Costly buildings are unnecessary, but warmth and comfort must be provided Very many horses are sleek and healthy although housed in places made of slabs and covered with straw. When the colt is six months old it should be housed. It would be well to tie it in the stable, and also to give lessons in leading with the halter to water twice a day. They will quickly learn to lead and tie up, and they can be caught in the yard without roping or using the crush-pen. Whilst stabled feed the foals well on good chaffed hay with a little green feed. At night, if the weather is fine and pleasant, turn them out in a small paddock or yard. His own foals are stabled for three weeks, then turned out into a good paddock and fed every day when natural feed is scarce. If the mares have much milk they should be relieved by hand each day for a short time. Colts should not be gelded until two years old, as they develop more vigor and style than when treated at one year of age. There is not much risk if the operation is performed by a careful man. When two and a half years old the colts should be handled and taught to walk well. They will then require very little breaking, and if harnessed in a team of quiet horses will soon take to the collar, but should not be worked more than half a day at once for a few weeks. With kind treatment they will soon take a full share of the work. Too much care cannot be devoted to the proper fitting of the harness, especially the collar. The collar should be cleaned daily and the colt's shoulders washed. If the shoulder scalds without breaking the skin wash with a weak solution of saltpetre.

Working.—During the principal working season in winter it is most important that the horses shall be well and regularly fed. When they come in from work they should be watered; if very hot give them only a little, then feed with good chaff and bran, or oats when cheap. At about 9 o'clock p.m. give a good grooming, bed down with straw and give another feed as before or fill the manger with loose hay. At 5 or 6 o'clock a.m. give another feed and brush down and a drink. At midday give a feed of boiled barley or crushed oats with their chaff. A feed of steeped wheat, if judiciously used, will make the horses thrive. In slack times the horses will do very well if turned on to good grass, and can do good work without feeding or grooming. Always try to keep none but the best breed of horses, as they are good doers and are easily kept in good condition.

The Hon. Secretary strongly recommended rugging all horses at night after 8·30 o'clock. For gripes Mr. Hutchinson recommended 1oz. laudanum, 1pt. linseed oil. Mr. Depledge recommended a bucket of new milk for worms; and for scours in horses Mr. Bain recommended a good lot of new milk.

Meadows, July 13.

Present—Messrs. J. Catt (Chairman), T. B. Brooks, G. Ellis, G. Usher, T. A. Buttery, H. V. Wade, T. Griggs, and W. A. Sunman (Hon. Sec.)

WINDBREAKS.—Mr. Griggs favored slab fences as shelters for live stock and gardens, as trees and shrubs gave too much harbor for predaceous birds. Most of the members favored wattles (Acacia pycnantha), but a few prefer sugar gum (Eucalyptus corynocalyx) and tree lucern (Cytisus proliferus).

DAIRYING.—Reported by the Hon. Secretary that the Dairy Instructor, who had recently visited the district, spoke in the highest terms of praise of the dairying possibilities of the locality. On evening of July 12 Mr. Thomson addressed a large public meeting on butter-making, diseases of cattle, and best breeds of cattle for dairy purposes.

RAINFALL.—For June, 5¼in.

Lyrup, July 4.

Present—Messrs. T. Nolan (Chairman), A. Weaver, T. R. Brown, D. Thayne, A. Menzies, P. Brown, W. Healy, D. J. Tree, W. H. Walling, O. Klemm, J. Tye, J. Sykes, A. Pomeroy, W. H. Wilson (Hon. Sec.), and three visitors.

RAINFALL.—For June, 2·64in.

SUCCESSION CROPS.—Mr. A. Menzies read a paper upon the question "Can Crops be arranged so as to avoid hurry in the Harvest-time." The only crops dealt with were cereals for grain and for hay. With irrigation, hay could be grown all the year round, but red rust would be likely to attack that grown in the summer and autumn. For grain, all crops should be sown between April 1 and June 30 [It would be valuable information to class the numerous varieties of cereals under the headings very early, early, medium, late, and very late, and to give their various characteristics as to yield, quality of grain, liability to disease, nature of straw, whether weak or strong, &c.—GEN. SEC.]

Size of Wheat Bags.—Mr. Thayne thought the size of wheat bags should be reduced one-half, as only one man amongst three or four could easily handle the large bags at present used. The smaller bags would not take much longer to load, as the carriers could move more quickly. After a good discussion a resolution was carried in favor of smaller bags.

Lucern.—Mr. Menzies suggested that lucern should be raked two ways, then mowed in an opposite direction, so as to lower the old stubble and leave a nice level for the summer.

Colton, July 1.

Present—Messrs. P. P. Kenny (Chairman), J. L. Huggins, W. A. Barnes, W. J. Packer, M. S. Kenny, A. S. Bartlett, B. A. McCaffery, and R. Hull (Hon. Sec.)

Questions.—Members wish to know if Pyrethrum cinerariæfolium (synonym, P. Dalmaticum), from the flowers of which Persian insect powder is made, has been successfully grown in South Australia. [Yes, by several persons, but only on a very small scale. Seeds can be procured from many seedsmen in various parts of the colony.—Gen. Sec.]

Mount Compass, July 8.

Present—Messrs. M. Jacobs (Chairman), S. Arthur, R. Cameron, C. S. Hancock, A. J. Hancock, A. Sweetman, J. Jenkins, and H. McKinlay (Hon. Sec.).

Seasonable Hints.—Prepare onion beds, plant early carrots and parsnips, sow tomato seeds in frames.

Rape.—The Hon. Secretary reported that rape sown for green manure had withstood heavy frosts.

Seed Potatoes.—Members prefer to plant whole potatoes, about the size of a hen's egg, for seed, especially on wet ground.

Wandearah, July 5.

Present—Messrs. G. Roberts (Chairman), J. Kurl, W. Roberts, E. H. Eagle, G. Collins, W. Munday, L. Stanley, E. Jacobs, W. J. Fuller, C. E Birks (Hon. Sec.), and one visitor.

Sand in Horses.—Members consider that, for horses troubled with sand, Ammonia caust. in ten to fifteen drops doses, or carbonate of soda in tablespoonful doses, is better than the use of oil or of enemas.

Drills.—Most of the members favor drilling-in of cereal crops; some favor drilling seeds with fertilisers; others were against this. One member reported having drilled in 80lbs of super, and another 1¼cwts. Thomas phosphate, and in both cases the fertilised crops were doing better than those unmanured.

Tree-planting.—The Hon. Secretary read the following paper:—

The importance of planting forest trees is not sufficiently recognised by farmers at the present time, when every year large areas of timber of all descriptions are being destroyed. Hitherto the effort to replace the timber lost in this way has been far short of what it should have been. The facilities offered by the Government for the distribution of the most useful kind of forest trees are such that they (the trees) are within the reach of every one, the packing and carriage of trees being the only expense in obtaining the trees. Sugar gums in bamboos at the most cost 5s. per 1,000, and these are for ordinary purposes the most useful and best suited for our soil and climate. Some of the reasons for planting are so apparant that little needs to be said about them. Shelter for stock, breakwinds, timber for building purposes and firewood, and the improved appearance that trees give to a property, are the chief reasons. The cultivation of the land intended for trees is of the utmost importance to ensure their success, especially with such an uncertain rainfall as ours. The land requires ploughing at least one year before planting to a depth of 9in. to 12in., and when there is a stiff subsoil a subsoiling plough, to go several inches deeper, is an advantage; then work it as often as necessary to keep it loose and free from weeds, and just before planting plough 5in. or 6in. deep and harrow; this leaves the land in fine tilth for planting provided the working has not been done when the land was too dry. Next mark out the places for the trees, from 9ft. to 12ft. apart for gums, then with the aid of a small hoe the trees can be planted, taking care to split the bamboo with a knife. Great care should be taken to prevent trees being exposed, especially open-rooted trees. If watering can be done at time of planting the ground must be hoed to prevent caking, also after rain it is necessary that the ground be stirred in some way or other, harrowing being the best and cheapest way if the plantation permits of it. Where sugar gums are introduced for a breakwind and there are several rows a good plan is to top one row, and thereby prevent the trees from dropping so many of their lower branches.

Members favored eucalypts grown open-root rather than those grown in bamboos. One of the visitors prefers to grow trees for himself. He sows seed in December or January, watering the beds well, and covers them with bags until the seeds have germinated.

ROLLING.—Members consider that rolling is only necessary to facilitate harvesting. It is better to wait for rain and then harrow the land down.

Millicent, July 6.

Present—Messrs. R. Campbell (Chairman), H. Hart, S. J. Stuckey, H. Oberlander, W. R. Foster, H. A. Stewart, A. McRostie, and E. J. Harris (Hon. Sec.).

RAINFALL.—For June: Millicent, 4·980in.; Mount MacIntyre, 6·360in. For year to date: 36·890in

WAX MOTH.—Chairman said the wax moth was in the district. Mr. Hart said that where the bar-frame hives are used it was easy to get rid of the caterpillars of the bee moth (or wax moth). The best plan is to keep the colonies very strong. The Italian (or Ligurian) bees are noted for their vigorous defence against this pest.

MANITOBA WHEAT.—Several members referred to Manitoba wheat as being likely to be suitable for this district. It is reputed to possess good milling quality.

PEAT FOR PACKING APPLES.—Mr. Stewart offered to supply any member of the Agricultural Bureau with trial sacks of peat free on rail at Rendelsham (bags not included), for purpose of experimenting on the packing of apples. Mr. Foster said he had tried dry Rendelsham peat for keeping potatoes, and they came out solid as when put in, even though they had shoots about 2in. long.

RUNNER DUCKS.—Two members reported having introduced Indian Runner ducks to the district.

STOCK STEALING.—Members agreed that some remarks in the *Australasian* upon stock stealing substantially applied to this district, and suggested that earmarks should be registered. Mr. Stewart said earmarks and brands should be given on the rail or advice note, and receiving agents should see that they tallied with the stock.

FOXES.—Mr. Stewart read the following paper:—

The fox is another kind of stock thief that has to be summarily dealt with. This one has a great liking for young lambs and poultry, and occasionally kills weak sheep. The following method for destroying the fox has been tried by a large number of sheepowners and others with marked success, but it is not generally known to all, and for their benefit I will endeavor to place it before them, having tried and found it a "dead certainty." Get a number of pieces of bait, such as sheep's or rabbit's liver and suet, parrots and sparrows, in fact all kinds of birds would do. Place in each bait as much strychnine as will be lifted on the point of a pocketknife—a lesser quantity will kill, only you will not have the satisfaction of picking up the dead fox. Having got your bait prepared, wrap each in paper so as they may be carried on horseback. For a drag or trail sheep's entrails or skinned rabbit will do. The evening is the best to lay the trail, as the scent will keep all night. Keep on the open country, and, at marked places, drop or bury a bait every 300yds. Any fox coming on the trail will follow it up, and will be found within a short distance of the spot where the bait was laid. Following these instructions you will be relieved of the thief. So numerous are the applications for the fox bonus, that a number of district councils are seriously thinking of discontinuing payment; but if the above plan is carried out there will be no necessity to bother about bonuses or taxes.

Mr. Stewart said he had killed four foxes within a week, and seven or eight others had taken the baits. Mr. Foster said he had heard of mixing arsenic and strychnine and placing it in pieces of liver, after which the liver was dipped in hot fat, wrapped in paper, and dropped on the trail. Members thought it better to use birds, as dogs would not be likely to pick up unappropriated baits.

Yorketown, July 7.

PRESENT.—Messrs. J. Koth (Chairman), A. Jury, C. Domaschenz, G. Bull, J. Latty, and John Davey (Hon. Sec.).

WHEAT GRUBS.—Mr. Latty said he had noticed a few patches on one of his paddocks which were being attacked by the grub of the cockchafer, which has done so much damage in former years, but members seem to think that there are not so many this season as there have been previously.

SEASON.—So far the winter has been rather dry, but the crops are looking well, although grass is backward.

Strathalbyn, July 11.

Present—Messrs. M. Rankine (Chairman), Hon. J. L. Stirling, B. Smith, W. J. Tucker, A. Rankine, H. H. Butler, W. M. Rankine, R. Watt, P. Cockburn, and J. Cheriton (Hon Sec.).

HOMESTEAD MEETING.—This meeting took place at Braemar, the residence of the Chairman, for the purpose of witnessing some practical demonstrations of the art of pruning by Mr. George Quinn, Inspector of Fruit. After lunch (provided by the ladies of the house) the party proceeded to the orchard, where Mr. Quinn showed practically how to form newly-planted fruit trees of different varieties; and then went on to prune older trees, explaining the reasons for each operation and the results that should be expected. Members were much pleased with Mr. Quinn's plain, practical, and instructive method of procedure.

Orroroo, June 23.

Present—Messrs. J. Moody (Chairman), G. Matthews, R. Coulter, W. S. Lillecrapp, S. Roberts, E. Copley, M. Oppermann, and T. H. P. Tapscott (Hon. Sec.).

SEED DRILL V. BROADCAST SOWER.—Mr. Coulter read the following paper:—

Unquestionably sowing is one of the most important parts connected with the farming industry. It is possible to expend much time and labor in the preparation of the soil and to be careful in the selection of the seed, and yet to materially reduce the harvest results by the seed being indifferently or unevenly sown; hence it is a matter of first importance that the machine used should be the best procurable for that purpose. The old method of hand sowing has been relegated to the past, and I am content for it to remain there. Any machinery that will make work easier will receive a hearty welcome from me, especially if it will do that work better. The broadcast seedsower succeeded hand sowing, and of recent years the seed drill has been reintroduced. Our time will not be lost by discussing the merits or otherwise of those machines respectively, with a view to aid us in selection of the best machine in the future. With this end in view I submit the following points for consideration, under three heads, viz.:—Construction, distribution of seed, and cultivation. Under construction will come—1. The cost. In this particu'ar the seedsower has a decided advantage. A seedsower can be purchased for £6 10s., while the cost of a drill is £40—an advantage of about £33 10s. 2. Wear and tear. And in this point, also, the seedsower has the advantage. It would be difficult to make a machine more simple in its construction, and while the drill is by no means a complex machine yet it is more intricate than the former, and consequently the cost of working and keeping it in repair would be about equal in proportion to the original cost. In the third point, also, the seedsower has the advantage, viz., the area of ground that can be covered in a day. Given about twenty acres a day as an average for a week's work to sow with the sower and harrow, and about fourteen is an average for a drill, gives the seedsower the advantage of six acres a day. Distribution of seed.—1. From my own experience, and what I have observed and heard from others, I have concluded that the seedsower cannot be relied upon as an equal distributor; while you might get one that would distribute the seed fairly equal, you would get another that would not. The drill is so constructed that it distributes the seed equally. 2. Notwithstanding what has been said to the contrary, it is just about impossible for a seedsower not to be affected by the wind, especially a cross wind, so much so that not unfrequently the strips can be seen for miles; or again, on what we term gusty days, sometimes the wind blowing very strong then dropping altogether, having the effect of sowing some places twice over, then to compensate matters misses a piece altogether, and not unfrequently the wind becomes so strong that sowing with the machine is out of the question. It is scarcely necessary to say that the wind has no influence whatever over the distribution of the drill. 3. With the exception of (in some machines) an agitator, there is no provision made in the seedsower for regulating the quantity of seed discharged according to the pace travelled the wheat escaping at about the same rate whatever the pace driven may be, so that when travelling up hill the chances are that the seed is sown thicker than when travelling down hill. To sow regular and even with a seedsower the pace driven must be regular also, and for that purpose you want horses made to order. In this point again the construction of the drill determines the quantity of seed that escapes, according to the pace driven. 4. There is a tiny creature that is a very considerable trouble to the farmer when sowing, viz., ants. Though small themselves the effect of their operations often are by no means so. In less than two hours after sowing I have seen the seed gathered in small heaps, sometimes in rows, and the little pests marching as if they regarded the wheat scattered as a special providence on their behalf. Often they will dictate to you the quantity of land you must sow in a day, so that often time is lost, and even then unless you are smart they will disarrange the equality of the seed. The drill covering the seed as it proceeds makes you master of them. Cultivation.—1. In a district where the rainfall is sometimes limited any machine that will tend to utilise to the most advantage the rain that does fall should be regarded with special favor. Seed harrowed in will be found more in the ridges than in the drills made by the tines, while seed put in by the drill lies in the bottom of the drill made by the machine to receive it. Water always gravitates to the lowest part, in this instance it will be the drill; hence the seed in the drill will secure all the benefit from any rain that does fall. 2. The method of harrowing the growing crop having been established as a distinct advantage, and becoming more general it will be found that seed drilled in will not be so liable to pull up by the harrows as that harrowed in, the plant being firmly rooted in the drill and not in the ridges. This also applies to the standing crop; the plant having a good root-hold will be better able to resist the force of a storm. 3. Invariably a percentage of seed sown and harrowed remains uncovered, and the grain thus on the surface falls a prey to birds or ants, or if untouched by them rarely grows. The drill assures the thorough covering of the seed so that none in that respect is lost. 4. Taking any quantity as sufficient per acre for seed, then taking into consideration the amount that can be regarded as lost by an unequal distribution through wind that remains uncovered, and possibly would be uprooted when harrowing the growing crop, when sown by the seedsower, it can be fairly assumed that less seed would be required if sown by a machine that avoided those disadvantages; consequently I believe that the drill, avoiding as it does those losses in seed, would give equal results from this point with less seed, I conclude in favor of the drill. To sum up. Points in favor of the sower—1. Cost of machine; 2. Least wear and tear; 3. Greatest amount of work done in a day. In favor of the drill—1. Reliability of the drill to distribute equally; 2. Unaffected by wind; 3. The discharge of grain regulated by pace driven; 4. Seed not affected by ants.

Mr. Moody said he had seen seed drills sixty years ago, but since then they had been greatly improved. Mr. Copley did not think the drill would take the place of the broadcast seedsower. He thought the drill too slow and too expensive. Mr. Roberts advocated sowing wheat by hand. A vote of thanks was accorded to Mr. Coulter.

Gumeracha, June 26.

Present—Messrs. W. A. Lee (Chairman), S. Gent, W. V. Bond, W. Cornish, W. Hannaford, and Dr. Nicholls (Hon. Sec.).

Sale of Infested Fruit.—After a short discussion the following resolution was carried unanimously:—"That in the opinion of this Branch the clauses in the Vine, Fruit, and Vegetable Protection Act providing for the infliction of fines for the sale of fruit infested with codlin moth should be repealed." It was considered that this provision was made in the early period of the outbreak to protect the many against the few, but now that the moth had spread over such a large area the great majority of the growers must suffer under these clauses while only a few would benefit.

Cherry Gardens, July 11.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, J. Lewis, C. Lewis, G. Hicks, G. Brumby, W. Nicholls, J. Metcalf, C. Ricks (Hon. Sec.), and two visitors.

Discussion.—A general discussion took place on plant and insect life. Mr. J. Lewis tabled one year's growth of quince shoot 8½ft. long.

Branch Show.—Matters in connection with the show of the products of the district to be held under the auspices of the Branch in March next were dealt with, and a committee appointed to make the necessary arrangements.

Johnsburg, July 3.

Present—Messrs. F. W. Hombsch (Chairman), H. Napper, W. McRitchie, L. Chalmers, T. Thomas, J. R. Masters, P. Caughlan, J. Sparks, F. W. Smith, T. Johnson (Hon. Sec.), and one visitor.

Reserve Fund for Farmers.—Members of this Branch are totally opposed to the scheme for the formation of a permanent relief fund for distressed farmers. It was stated that the majority of farmers desire to establish something upon the basis of a people's bank, so that those who require assistance in time of distress could get help, and repay the amount on easy terms. It was decided that Messrs T. A. Thomas, Melbourne, and Hombsch should be requested to formulate a scheme and submit the same for consideration.

Wheats.—Mr. Thomas reported that Bartlett's Crossbred and Indian King wheats were making such rapid growth that he had deemed it advisable to feed it down a little, as they showed signs of coming into ear.

Exhibits.—Mr. Thomas tabled Burpee's All-head cabbage, mangolds, and Green-top turnips, all of excellent growth, without watering.

Maitland, July 1.

Present—Messrs. H. R. Wundersitz (Chairman), C. F. G. Heinrich, J. Smith, W. Wilson, Thomas Bowman, O. Treasure, and C. W. Wood (Hon. Sec.).

Fallowing.—Mr. Smith said early fallow and frequent light harrowings afterwards whilst the soil is still damp is the best treatment for "crabhole" or "Bay of Biscay" soils, as dry working seems to promote "takeall." Mr. Heinrich considered early fallowing equal to 3in. of rainfall. Mr. Wundersitz thought that fallowing impoverishes the soil to a certain extent, and no doubt involves the loss of a considerable amount of feed. Most of the members disagreed with this last proposition, as they considered that the extra crop gained through fallowing more than compensated for any possible loss of feed. Mr. Wilson doubted if fallowing pays in the long run. Mr. Bowman strongly supported fallowing and the use of manures, thinking that it will pay to fallow more land and raise crops with manures and keep a lesser number of sheep. The general feeling was strongly in favor of fallowing early—directly after seeding is finished, then work the soil lightly whilst damp and use manures with the crop. Working the soil whilst dry is not successful in this district.

Applying Fertilisers.—In answer to question Mr. Heinrich stated that he mixed wood ashes with English super. to make it run more readily through the drill, and this season he had also used sifted well-rotted farmyard manure with the same object in view.

Nantawarra, July 18.

Present—Messrs. E. J. Herbert (Chairman), H. J. C. Meyers, J. W. Dall, A. L. Greenshields, J. Nicholls, A. F. Herbert, S. Sleep, R. Uppill, T. Dixon (Hon. Sec.), and one visitor.

Business.—Nothing beyond routine business was done.

Crystal Brook, July 15.

Present—Messrs. G. Davidson (Chairman), W. J. Venning, J. C. Symons, J. Chambers, A. Hamlyn, R. Pavy, W. Hamlyn, C. Dabinett, G. Scott, M. Weston, W. Natt, J. Gum (Amyton Branch), and George Miell (Hon. Sec.).

Officers.—Mr. G. Davidson re-elected Chairman, Mr. J. C. Symons elected Vice-chairman, and Mr. George Scott Hon. Secretary. Officers for past year thanked.

Field Trial Society.—The delegates from several of the Branches interested having failed to attend the summoned meeting, it was decided to write each Branch to ascertain the wishes of members.

Treatment of Horses with Cough.—At previous meeting Mr. Venning read a short paper in reply to an inquiry by Colton Branch, *re* remedy for horses suffering from violent cough and heaving sides. Upon advice of the Chief Inspector of Stock the General Secretary had recommended linseed oil. Mr. Venning could not see of what use linseed oil could be in an affection of the air passages, but it might be good as a purgative, though Miles (a veterinary authority) says it is very uncertain in action. The same authority, on treatment of chronic cough, says, try the following, made into a ball, every morning:—Powder of ipecacuanha, ½ drachm; camphor, 2 drachms; extract of belladonna, 1 scruple. Mr. Venning recommended homœopathic treatment. If the cough is of a dry tickling character, in conjunction with or after a cough and sore throat, give belladonna and mercurius minus alternately. If the cough does not yield to this, and is attended with much difficult expectoration of a tough stringy nature and constant cough, substitute kali bichromicum for mercurius. If the cough is the result of some pulmonary ailment, try bryonia and phosphorus; and if it does not yield to this, substitute tartarus emeticus for bryonia. If the cough has been long standing and does not yield to the above remedies, and cannot be traced to any particular cause, give tartarus emeticus and drosera in alternation, three doses every day, for eight days. If, on listening to the coughing and breathing of the horse, he has a hoarse cough and a rattling of mucus in the air passages or in the chest, give hepar sulphuricus. When the cough is worst at night, and after eating and drinking, or upon going up a hill, especially when attended with difficult breathing, give arsenicum. For dry, hoarse, spasmodic cough, worst in the morning and after eating or exercise, especially when the stomach is disordered, the tongue furred, the bowels constipated, &c., give nux vomica. If the cough is of an asthmatic nature, difficult breathing, short breath, gasping fits resembling asthma, threatening suffocation, give arsenicum; and if with a dry irritating cough in the bronchia, alternate ipecacuanha with arsenicum. When the discharge of mucus is very copious, the cough loose, the rattling loud, and the breathing much distressed, give tartarus emeticus. For a constant dry tittilating cough, give chamomilla. When the cough is dry, with more or less fever, alternate aconite with belladonna. During treatment give bran mashes, long hay, green feed if possible. Doses:—Of ordinary homœopathic tinctures give from fifty drops to a teaspoonful; size of dose must depend upon size, age, and structure of the horse. If the mother tinctures are used, the doses range from fifteen drops to twenty drops.

Gladstone, July 1.

Present—Messrs. J. King (Chairman), J. Brayley, E. Matthiesson, J. Shephard, J. H. Rundle, W. A. Wornum, J. Gallasch, and J. Milne (Hon. Sec.).

Exhibits.—Mr. King tabled a sample of Sullivan's Early Prolific wheat from Albury, the yield from which last season was 53bush. 20lbs. to the acre. Although rather late, Mr. King intends to sow a few acres with it.

Farmers' Fund.—Members are not in favor of this fund.

Port Broughton, July 18.

Present—Messrs. W. Bawden (Chairman), J. Harford, R. Storr, E. Dalby, E. Dennis, G. Pattingale, S. M. Bawden, H. A. Dolling, H. H. Whittle, and J. Barclay (Hon. Sec.).

Officers.—Officers for past year thanked. The Chairman was re-elected. Mr. Jas. Barclay was elected Hon. Secretary.

Annual Report.—The Hon. Secretary read annual report. Nine meetings were held during the year, with a fair average attendance of members. Several practical papers were read, and many useful discussions had taken place. A conference of Mid-Northern Branches had been held at Port Broughton on April 26, which was well attended and represented by the Branches of Port Pirie, Kadina, Koolunga, Brinkworth, and Mundoora, Pine Forest, and Port Broughton, as well as by a number of visitors, totalling seventy in attendance. The papers included "Seed Wheats," by Mr. Wilson, of Port Pirie; "How best to Seed Land drilled in Previous Years with Fertilisers," by Mr. Jettner, of Pine Forest; "Export of Lambs," by Mr. P. Roach, of Kadina; "Cultivation of the Soil," by Mr. Everett, of Brinkworth; "Analysis of Manures," by Mr. Jettner, of Pine Forest; "Bureaus and their Uses," by Mr. J. Miller, M.P.; several amusing, interesting, and instructive papers by Mr. Peter Allen, of Green's Plains; "Farmers and their Teachers," by Mr. B. Crossby, Kadina; "Value of Sheep on Small Holdings," by Mr. T. Barker, of Port Broughton; "Judging at Agricultural Shows," by Mr. R. Bawden; of Port Broughton; "How to Beautify the Home and make Farm Life Attractive," by Mr. Horne, of Koolunga; "Paint and its Use," by Mr. R. Storr, of Port Broughton; "Farmers and their Products," by Mr. E. Dennis, of Port Broughton; "Wheatbags and Farmers," by Mr. R. Barr, of Pine Forest.

Finniss, July 3.

Present—Messrs T. Collett (Chairman), T. R. Sumner, S. Eagle, R. J. Ness, A. E. Henley, W. W. Heath, P. Gooding, S. Collett (Hon. Sec.), and five visitors.

TOBACCO.—Mr. Heath tabled three samples of tobacco cured and ready for use, all grown on the Black Swamp. Mr. Willcock tabled tobacco plant in flower, strong and healthy, unaffected by frost, grown on light sandy soil.

MIXED SEEDS FOR HAY.—Members think a mixed crop of wheat and oats —Cape oats with Steinwedel or Smart's Prolific wheat, or Algerian oats with Purple Straw wheat—is the best for hay.

GROWING FOOD FOR LIVE STOCK.—Members are of opinion that it does not pay to keep stock without providing food for them. All prefer, if feeding with corn, to crush it well.

SURPLUS FRUIT OR VEGETABLES.—The best way to use these is to dry or preserve in cans all surplus fruit, and to pickle vegetables in strong brine.

FEEDING FOWLS FOR LAYING.—Members prefer feeding laying hens upon clean sound grain, wheat and barley alternately.

HOMESTEAD MEETING.—This meeting was held at the home of Mr. T. R. Sumner, where a liberal tea was provided by the host and hostess.

Kapunda, July 8.

Present—Messrs. W. M. Shannon (Chairman), G. Teagle, J. A. Schultz, H. T. Morris, Peter Kerin, J. J. O'Sullivan, T. Scott, jun., G. Harris, J. H. Pascoe, Pat Kerin, J. O'Dea, W. Flavel, and T. Jeffs (Hon. Sec.), and one visitor.

FERTILISERS —Mr. B. R. Banyer read a paper, as follows :—

There is a considerable lack of information respecting the nutritive (or plant-food) values of what are known as "artificial manures," or fertilisers as they are now more commonly and properly called. This is not at all to be wondered at. Not only are their composition and properties a new subject for the farmer to master in his little leisure time, but their consideration involves several chemical problems which are not easy for the lay mind to grasp, even with explations free from the technicalities and mystical formulæ which usually surround references to the composition and fertilising qualities of the various substances, natural and artificial, which are offered to the tillers of the soil as restorers of weakened and enrichers of naturally poor land There are several points to be considered in relation to the nutritive value of fertilisers, but for the purposes of this paper it will be sufficient if confined to two or three, the others having reference chiefly to the chemical qualities of soils, their value as plant food, and the best manner in which to supply the qualities which the soil may be devoid of or deficient in, having regard to the kind of crops which it is desired to produce. The latter necessitates a practical acquaintance with chemical analysis and a knowledge of the chemical nutriment and physical conditions—such as looseness or compactness of soil—which the particular description of vegetation requires to bring it to perfection. This scientific achievement can only be expected in the farmer of the future, as he will have had opportunities of acquiring it, as he will also have had the benefits of the experience of his forefathers in their attempts at producing wheat upon sickly, overworked (*i.e.* overcropped), or otherwise unsuitable soil, to guide him in the direction from which improvement may be expected. That stage in agricultural reform has been passed when there can be any reasonable doubt as to the value of and absolute necessity for artificially supplying to the soil what it lacks, whether that deficiency be natural or the result of improper working or a combination of both causes. Occasionally we hear that this or that kind of fertiliser in some way is a failure, but the notions that the cause is necessarily due to the dressing are rapidly getting fewer and farther between, the fact now being generally admitted that the fault of unexpected results is not usually with the fertiliser, and probably lies with the use of it upon land already abundantly supplied with the ingredient which the fertiliser was rich in and poor in what was not or only poorly possessed by the fertiliser; in other words, the fertiliser used was not suited to the requirements of the particular soil or crop. These remarks presume that the fertiliser is what it is pretended to be. Having outgrown the prejudice which arose from this misuse, the use of fertilisers has now become to be almost universally acknowledged as one of the essentials to successful farming. The lesson, then, should be to learn how, when, and what to apply to the soil as a fertiliser. This requires, as already observed, a knowledge which it would be unreasonable to expect the older farmers, speaking generally, to possess, or even perhaps to acquire, and even the younger ones will need to put into it some close and patient study if they wish to get down to the subsoil of knowledge, if the expression may be allowed as appropriate. To secure the best results superficial information will not be sufficient, though it may go a long way to improve on the present state of things. The check which the Fertilisers Act has given to the impostors who have been taking advantage of the farmers' confidence and ignorance, and the information circulated by means of the *Journal of Agriculture* and the Press generally as to the loss sustained by land carrying continuous crops of cereals, especially wheat, without rest or change or artificial restoration, has also been beneficial. If the farmer takes advantage of this he is not only fairly well insured against imposition, but with a little intelligent consideration and observation will gain some idea as to the treatment his soil requires. He is also assisted very largely by the best manufacturers, who, as a matter of business, have made themselves acquainted with the probable class of fertiliser that will be most adaptable for the different parts of the country and the crops produced there. Nothing further need be said under this head. One of the chief difficulties with the purchaser of fertilisers is the, to him, ambiguous nomenclature (or names) by which the values of the fertilisers are described. He meets with such words as "basic," "tribasic," "tricalcic," "phosphate," "soluble," "insoluble," "made soluble," &c., which, though clearly and definitely understood by the initiated, are as Greek to the lay mind. An attempt will be made to explain these terms in simple language, and to describe their relationship as well as the importance the properties they represent have in the constitution of a fertiliser, and its value for the use to which the buyer may wish to put it. For wheat-growing districts the phosphatic fertilisers, *i.e.*, those containing phosphoric acid, are those most in demand, so that the terms "soluble" and "insoluble" phosphates are those which are principally dealt with. The value of these fertilisers is dependent upon the solubility of the phosphatic salt which they contain. Hence it is not necessary to say on the negative side more than that their value, taking water-soluble phosphate as the standard, depreciates with the increase of insoluble character of the phosphates. The value of a phosphatic fertiliser, which is that most generally in use, is in proportion to the extent to which the phosphatic salt (or compound) is in a state in which it is soluble in water, and hence the more readily acted upon by the moisture of the soil; but whilst that is so the insoluble phosphate is not to be discarded, for the bulk of it is soluble in the course of time, owing to the digesting properties of the acids in the earth and the action of the atmosphere, which has access to it through the more or less porous nature of the soil. And hence, incidentally, the benefits of keeping the soil open and the reason for fallowing. The term "insoluble," therefore, is scarcely correct in general application. Though a phosphate may not be soluble, or only sparingly so, in water, the salt may be made soluble in the soil by the affinity (or liking) of certain acids in the soil for the lime which is combined with the phosphoric acid in the fertiliser, and in some cases by other processes of decomposition. The use of baking powder is a simple illustration of this affinity and chemical combination. The acid in the powder, when moistened, is brought into an active state in which it combines with the alkaline soda forming a new chemical substance (or salt) and liberating the carbonic acid which was combined with the soda (alkali), and which in its efforts to escape through the dough with which it is mixed produces that cellular (or spongy) formation of the dough for which good bread or pastry is noted. This is the result of what is called chemical combination. The results of all chemical combinations, it must be understood, are not characterised by the liberation of the gas mentioned. When certain chemical changes take place in a phosphate salt that was previously "insoluble," the phosphoric acid is made available—brought into a condition in which it is soluble in water—for absorption by the roots of the plant. Phosphates soluble in ammonia citrate are also spoken of, and some of the analyses are now being given as soluble in this chemical This form of stating the solubility has been common of late to America, where authorities assert that there is very little difference between the phosphates soluble in water and those in ammonia citrate, although the latter is valued at 10 or more per cent. less than the former. Strictly speaking a "soluble phosphate" is one that is soluble in water, but in the manure trade the term means the amount of "tricalcic (or tribasic) phosphate" (or phosphate of lime) that would have to be acted upon by sulphuric acid to give the soluble salt containing an equivalent to a given percentage of soluble phosphoric acid. Confusion is often caused by one analysis stating that a fertiliser contains, say, 18 per cent. of "soluble phosphoric acid" and another of the same fertiliser, say, 39 per cent. of "soluble phosphate." Both statements are identical, one being the soluble phosphoric acid and the other the quantity of phosphate of lime that, acted upon by sulphuric acid, would produce the soluble salt the quantity of soluble phosphoric acid in which would be 18 per cent. A tribasic phosphate is a phosphate in which one part of phosphoric acid is combined with three parts of lime. A tricalcic phosphate acted upon by sulphuric acid is converted into monocalcic - one part of lime, two of water, and one of phosphoric acid—which is soluble in water and is really a superphosphate. But some of the practically insoluble phosphates are brought by very fine pulverisation (or grinding) into a condition in which water and the comparatively weak acids of the soil act upon them readily. Thomas phosphate, basic slag, as it is also called, is such a one. This slag is the by-product from the process of converting into steel pig iron manufactured from British iron ores, most of which contain phosphorus. It has been proved that if this slag is ground to a certain degree of fineness, the phosphoric acid is available for plant food. It might be mentioned that Thomas basic slag is reputed to be ground to a fineness that from 80 to 90 per cent. of it will pass through a sieve containing 10,000 holes to the square inch, and that is what is meant by 80 or 90 or other percentage fine ; it is further claimed that in the slag four parts of lime have combined with one of phosphoric acid, and that in this combination the salt is less stable and is consequently more readily soluble in the soil. These facts are mentioned, not in special praise of Thomas slag, but by way of illustrating the complex—almost anomalous—character of such terms as "soluble" and "insoluble," when used in connection with fertilisers. Care requires also to be exercised by the purchaser of fertilisers that he is not deceived by terms which, though apparently genuine and honest, are used only to trap the unwary. Reference is made to analyses giving, for instance, the percentage of "phosphate of lime" only. As has been stated, one of the phosphates of lime contains three parts of lime to every one of phosphoric acid, whilst another contains two parts of lime, and another one. Purchasers need to be on their guard against this form of stating the analyses. Sixteen per cent. of phosphoric acid is a very different thing to 16 per cent. of "phosphate of lime." Certainly the quantity of phosphoric acid contained in a given quantity of phosphate of lime is easily calculated where the phosphate is fully described—whether tricalcic, bicalcic, on monocalcic—*i.e.*, containing three, two, or one part of lime to every one of phosphoric acid. But chemical formulæ and equations are not yet brought within the education of farmers. The farmer who refuses to purchase on the "phosphate of lime" percentage basis will always be on the safe side. These remarks probably cover everything which it was intended to refer to, and it is trusted that they have been sufficiently intelligible for their meaning to be easily understood. There are several other aspects in which the question of fertilisers might be dealt with, but they do not come within the scope of present consideration.

Various questions were answered by Mr. Banyer, and a very hearty vote of thanks was accorded him. A short conversational discussion ensued.

EXHIBITS.—Mr. J. H. Pascoe, of Taylor's Gap, laid on the table two samples (White and Red) of Kaffir corn, grown from seed distributed by the Bureau. The heads shown were of fair quality, but Mr. Pascoe said the remainder were inferior to them. Stock ate it readily.

Pyap, July 19.

Present—Messrs. J. Holt (Chairman), W. Axon, T. Smith, A. J. Brocklehurst, B. T. H. Cox, C. Billett, J. Harrington, J. Bowes, J. Arnold, T. Bankhead, C. Coulls, H. Mills, E. Robinson, W. C. Rodgers (Hon. Sec.), and two visitors.

CHAIRMAN.—Mr. B. T. H. Cox was elected chairman.

LUCERN PEST.—Mr. Holt asked for information *re* pest destroying lucern near Adelaide. It had not yet made its appearance on the settlements, and they should be prepared to deal with it as soon as it did. [This insect, known as "springtail" (Smynthurus viridis), destroys the lucern and other plants by eating the outer covering of the leaves, simply leaving a whitish skeleton. The only proved effectual remedy is gas lime applied to crops attacked.—GEN. SEC.]

FORAGE CROPS.—A discussion took place on the best forage crops for this district Mr. Brocklehurst favored lucern, with irrigation. A cut could be obtained every five weeks. Mr. Bowes found cow peas enriched the milk and increased the flow. Mr. Robinson considered that maize, sorghum, and similar plants grown on the flats and irrigated would be profitable. The Hon. Secretary had noticed that chaff from crops grown on the flats lower down the river was not relished by stock. It had a distinctly bitter flavor, and he was afraid other crops grown on the same land might be similarly affected. Mr. Arnold agreed, and Mr. Smith stated that he had it on good authority that the millers had refused to purchase wheat grown on these flats, but no reasons for this action were forthcoming. The Hon. Secretary was instructed to make inquiries as to difference in quality of wheats grown on different soils.

Insects in Flour.—Members wished to know whether the fumes of bisulphide of carbon would have an injurious effect on flour if used for destroying insects. [Most probably not; but it is possible that the fumes would take a long time to permeate such a dense body as flour. Try the effect on a small quantity of flour.—Gen. Sec.]

Lucern Hay.—A letter was read from Professor Lowrie on the value of lucern for hay, but it was not stated when lucern should be cut. Members were of opinion that the best time to cut it was when it was in flower. [Correct. - Gen. Sec.]

Pickled Wheat for Fowls.—Mr. Arnold found that giving his fowls a little pickled wheat occasionally kept them in good condition.

Treatment of Stubble.—Some members considered it best to burn the stubble; others, to plough it in.

Balaklava, July 8.

Present—Messrs. P. Anderson (Chairman), C. L. Reuter, J. Vivian, A. Manley, E. Roberts, J. Mills, W. H. Thompson, A. W. Robinson, W. Smith, E. Harris, and E. M. Sage (Hon. Sec.).

Rolling v. Harrowing.—All rolling should be done before the sowing, but if land is rolled after the seed is put in then it should afterwards be harrowed. Rolling light land is injurious to the crop. Mr. Vivian said he had this year harrowed some early sown wheat to kill a yellow weed (named locally "native chamomile") and it had killed it nearly all, whilst the wheat was looking better for the harrowing. Mr. Reuter had harrowed to kill sheepweed, and the grain crop was much benefited. Mr. Smith harrowed part of his crop last year, and it was the best he had both in straw and grain. Mr. Manley considered harrowing light land would consolidate it whilst leaving the surface open. Members think stump-jump harrows are the best to use.

Exhibits. —The Hon. Secretary tabled plant of Red Kaffir corn, and reported that it was the strongest kind he had grown, but it had not seeded well; even a plant two years old had failed to ripen seed. The plant was about 3ft. 6in. high and the head only just out. It had been grown without water. White Kaffir corn had headed very much better, but was not such a heavy cropper. Florida Velvet bean was a dead failure.

Naracoorte, July 8.

Present—Messrs. S. Schinckel (Chairman), G. Wardle, D. McInnes, H. Buck. J. Wynes, H. Smith, O. Hunt, B. S. Roach, and G. Greenham (Hon. Sec.).

Pure Jerseys.—The desirableness of increasing the number of Jersey cows in the district was discussed, and it was stated that a herd of pure Jerseys was maintained at Struan, and that cows could be purchased, and that the State bull "Royal Progress" could be used.

Farmers' Relief Fund.—Members consider that a number of farmers are working in the North in localities where the climatic conditions are quite unsuitable for growing cereals—where only one good season in six is experienced—and decided that they do not approve of a permanent fund for relief of distressed farmers, although they have every sympathy with them.

Ploughing.—Mr. H. Buck read a paper on "Ploughing on Different Sorts of Soil," as follows:—

Before commencing on the principal subject that I promised to address you on, I will say a word in regard to plough horses. As a rule horses generally get a spell from after harvest till ploughing time, and being turned out on the grass are liable to pick up the sand, and by fetching them in and putting them straight in the plough, they are likely to get bad after two or three feeds of chaff. Therefore they keep you idle a week or so waiting for them to get better. To prevent this I would advise bringing them in a week beforehand and feed them on a little at a time, and not heat them. Now for my subject. First I will start with the strike out to form a proper crown for ordinary ploughing. Set your plough at 2in. for the scratch, then set at 5in. to cover; scratch with one round. In coming back run the big wheel about 4in. off the scratch so that each furrow will overlap half the scratch and cover it completely. This completes the crown. Then set the plough with a 9in. furrow and 4in. deep, which in my opinion is the depth that new ground should be ploughed. The second year 5in., and the third year 6in. By so doing you will thoroughly mix the soil. In clear ground run the plough slightly over on the little wheel, as this will make a better seed-bed; but on stony land I prefer it more over on the big wheel, as it will help to prevent the plough from rising up behind when striking a stone. Set coulter in a good sloping position. Allow the point of coulter ½in. back from the point of the shear. That will make the coulter cut better and sweeter. In sandy soil set coulter level with the outside of shear, but in sticky soil it requires to be from 1½in. to 2in. away from the shear cutting in land. See that the coulter and shear are always thin and sharp, especially in sticky soil. The clearing up is a main point in ploughing. See that you do not finish too deep, as it is a great mistake. The mower and binder will prove it, especially on hard ground. In finishing up I prefer having a furrow and a half for the last round, and not two large furrows, as it will make a better finish and save taking out the crumb furrow. I find by lowering the little wheel about 1½in. the second last furrow that this will steady the plough for the finish, and also take half the crumb furrow out. I would like to mention that I am only alluding to ploughs we are using about here.

Mr. Hunt considered the first furrow would be too high with the plough set at 5in. Mr. Buck said the third furrow would be the proper depth. Mr. Schinckel did not like a high furrow; the instructions were right for good ground but not for sticky soils. Most members agreed that ploughing-match work was not the best for practical purposes. The Chairman did not approve of sole-plates on sticky ground. Mr. H. Smith thought the Jubilee plough best for sticky soils.

PICKLING WHEAT FOR SEED.—The prevalence of bunt in wheat crops last season was attributed to the very inferior character of much of the bluestone on the market.

TUBERCULIN TEST.—The necessity for testing dairy herds for tuberculosis was referred to, and, in answer to inquiries made by the Chairman, Mr. Williams, stock inspector, had replied that the cost would be 25s. for twenty head of cattle. The Chairman said all dairy cows should be tested about once a year, and if arrangements could be made with several owners to have their cows tested at the same time, the work could be more cheaply done

THE STATE BULL.—Mr. Bates asked that the Jersey bull should be stationed at his farm for the months of January and February. He had proper shed and accommodation. It was too far to travel cows from Stewart's Range to Naracoorte. After discussion the request was granted.

EXHIBIT.—Mr. Buck showed a turnip 31in. in circumference, a variety of Purple-top improved by himself by continuous selection.

Mount Pleasant, July 14.

Present—Messrs. F. Thomson (Chairman), W. Vigar, J. Maxwell, L. McBean, J. F. Miller, and H. T. Hull (Hon. Sec.).

DRILL V. BROADCAST.—Mr. Vigar reported having sown one acre broadcast and one acre with drill, as arranged, with practically the same quantity of grain for each. So far the drilled wheat has come up more regularly and looks better than the other.

FENCES.—In regard to the cheapest and best kinds of fences Mr. McBain advised gum posts at 30ft. apart, with iron standards 10ft. apart, barbed wire on top of posts, and five plain wires. Fence to be 3ft. 6in. high. Barbed wire not to be fixed with staples, but tied to posts with wire running through gimlet holes in posts. The use of iron tends to considerable gain in cost of erection. In comparison with the ordinary fence with wooden posts every 10ft., the cost of standards and wood posts at 30ft. apart would not be more than one-half.

Rainfall.—For June, 4·34in.

Robertstown, July 19.

Present—Messrs. A. Day (Chairman), W. Mosey, J. Armstrong, F. Fielder, H. Rohde, T. Hagley, and S. Carter (Hon. Sec.).

Exhibit.—Mr. Mosey tabled sample of Bartlett Crossbred wheat. Plant was 2ft. long and healthy; seed sown first week in May, which appeared to be too early.

Carobs.—Of a large number of truncheons of carob trees planted by members last year, only one has grown.

Windbreaks.—Mr. Hagley said he found that straw stacks built in the paddocks made the best windbreaks. A post and rail fence, 3ft. 6in. high, should be put round the stacks so that cattle can reach over to get at the straw.

Watervale, July 17.

Present—Messrs. C. A. Sobels (Chairman), S. Solly, E. W. Castine, W. Smith, W. Field, J. Thomas, H. Scovell, L. Buring, B. Perrin, E. Treloar (Hon. Sec.), and one visitor.

Red Spider.—Mr. Smith tabled apple twig infested with small round red insect. [These proved to be the eggs of red spider. Trees should be sprayed at once with lime, salt, and sulphur compound, made as follows:—Boil 10lbs. lime and 20lbs. sulphur in 20galls. water, until the sulphur is thoroughly dissolved; then add 15lbs. lime, 15lbs. salt, and 40galls. of water, stirring well. Strain the mixture and spray while warm.—Gen. Sec.]

Drilling in Seed.—Members reported drilled crops far in advance of those broad-casted. Those members with experience reported better results from shallow than from deep drilling.

Baroota Whim, July 19.

Present—Messrs. F. H. Flugge (Chairman), T. Simper, C. F. Besson, W. Bridson, A. Ranebury, and C. W. Hoskin (Hon. Sec.).

Farmers' Relief Fund.—Members agreed that a permanent relief fund for farmers would be of great benefit.

Fertilisers.—A discussion took place on the use of fertilisers. Members were unanimous that commercial fertilisers were not required in this neighborhood.

Calca, July 8.

Present—Messrs. A. B. Smith (Chairman), Jas. Bowman, R. H. Squire, and D. P. Thomas (Hon. Sec.).

Business.—The principal business arose from letter from Colton Branch, asking for assistance in endeavoring to obtain a regular steamer service between Port Adelaide and West Coast port. Members decided to do all in their power.

Angaston, June 21.

Present—Messrs. J. E. Swann (Chairman), W. Sage, E. Thamm, P. Radford, A. Sibley, A. Salter, R. Player, W. Sibley, F. Thorne, E. S. Matthews (Hon. Sec.), and nine lady visitors.

Social Meeting.—After inspecting the Yalumba vineyards and fruit-preserving works members adjourned to the Chairman's residence, where a most pleasant time was spent in music, recitations, parlor games, &c. The host and hostess were thanked.

Codlin Moth Regulations, &c.—The sub-committee's report was submitted by Mr. W. Sage, and the recommendation that action be taken to support the strict enforcement of the regulations under the Vine, Fruit, and Vegetable Protection Act was confirmed.

Angaston, July 22.

Present—Messrs. J. E. Swann (Chairman), P. Radford, A. Sibley, R. Player, W. Sibley, A. Salter, J. Vaughan, F. Salter, A. Friend, and E. S. Matthews (Hon. Sec).

Protection of Insectivorous Birds.—The Hon. Secretary was requested to write to the School Board of Advice directing attention to the value of our native insectivorous birds, and to the necessity for discouraging the practice of destroying them and the robbing of their nests.

Phylloxera.—This Branch strongly supports the Phylloxera Bill now before Parliament.

Codlin Moth Regulations.—Members earnestly desire that the regulations preventing the sale and distribution of fruit infected with the larvæ of codlin moth, &c., shall be strictly enforced.

Bute, July 22.

Present—Messrs. W. Sharman (Chairman), M. Stevens, E. Ebsary, W. Sluggett, A. Schroeter, S. Lambshed, J H. Barnes, D. Green, W. Hamdorf, H. Schroeter, M. Langsford, and M. H. Hall (Hon. Sec.).

Business.—Chiefly formal. Several matters were discussed, but no conclusions arrived at.

Quorn, July 20.

Present—Messrs. R. Thompson (Chairman), Jas. Cook, G. Altmann, H. Porter, J. Johnson, and A. F. Noll (Hon. Sec.)

Business—Nothing done.

Mount Remarkable, July 20.

Present—Messrs. A. Mitchell (Chairman), G. Yates, W. Lange, C. E. Jorgensen, H. B. Ewens, T. P. Yates, H. Humphris, J. B. Murrell, D. Roper, T. S. Bishop, J. H. Girdham, and T. H. Casley (Hon. Sec.).

Planting Fruit Trees.—Question, "Can any reason be given for planting young fruit trees a week before heading them down?" Members are agreed that it is better to prune them back before planting.

General Harvester.—The Hon. Secretary had no doubt that the "General Harvester" will in the future be far before the present style of harvesting. He also advocated the use of the 200lb. bag for wheat.

Tatiara, July 24.

Present—Messrs. T. Stanton (Chairman), R. Scown, H. Killmier, F. Smith, F. J. Green, C. H. W Wiese, R Penny, and W. E. Fisher (Hon. Sec.).

Codlin Moth.—Mr. Wiese said that apples. badly affected by the caterpillars of the codlin moth, were being sold in the district. The Hon. Secretary was requested to write Penola and Naracoorte Branches with a view to united action to prevent, if possible, any relaxation of the regulations under the Vine, Fruit, and Vegetable Protection Act.

Inkerman, June 20.

Present—Messrs. T. Forrest (in chair), D. Fraser, E. M. Hewett, W. Fraser, and W. A. Hewitt (Hon. Sec.).

Officers.—Mr. D. Fraser was elected Chairman, and retiring officers were thanked.

Forest Trees.—A discussion took place upon conservation and establishment of forest trees, and the influence of forests upon climate and rainfall. It was resolved that this Branch strongly recommends all local governing bodies to devise schemes for systematic tree-planting upon the sides of leading lines of roads.

Inkerman, July 18.

Present—Messrs. D. Fraser (Chairman), James Simpson, W. Board, S. Wills, J. Lomman, W. Fraser, G. Peter, and W. A. Hewett (Hon. Sec.).

Excursion Fares for Farmers.—Members are of the opinion that excursion fares should be extended over all our railways for a week or two after the March and September shows in Adelaide, in order to give farmers an opportunity to travel to any part of the colony.

Wheat Grubs.—The Chairman said that grubs were doing considerable damage to his and some of the neighbors' wheat crops. They eat the plant off just above the ground. Land that was ploughed and left open for three weeks before sowing is not affected.

Arthurton, July 20.

Present—Messrs. W. Short (Chairman), W. H. Hawke, J. Pearson, M. Baldock, C. L. Palm, and J. B. Rowe (Hon. Sec.).

Annual Report.—The Hon. Secretary presented his annual report. Very little work had been done. There were thirteen members at the beginning of the year, and two had since been added; but four have resigned, leaving eleven members. Six meetings had been holden, with an average attendance of over nine, and an average of nearly four visitors. Only one paper was promised, but that was not provided. Discussions had taken place upon "Bunt in Wheat, and Measures for its Prevention," "Farmers' Permanent Relief Fund," "Standard Average Weight of Wheat," "Field Trials," and several experiments have been conducted in cultivation, &c. The interest taken by members in the work of the Branch is too much one-sided. Mr. Higgins' paper on "How to Improve the Meetings of the Branch," read at Minlaton Branch and published in the July number of our *Journal of Agriculture*, expresses the proper idea in a concise manner. Each member should feel that he is individually responsible for bringing forward something at each meeting, and that will naturally increase each member's interest in the work. No one can deny the amount of good that has been done in the interest of agriculture during the past ten years, through the establishment of the Agricultural Bureau. This should spur us on still further in our endeavors to improve in every direction.

Rabbits.—As rabbits are becoming a nuisance, it was resolved to request the Clinton district council to take steps for their suppression.

Rolling Crops.—Most of the members are of the opinion that it is not wise to roll too soon, because, if rain falls soon after, it will cause the surface to cake, and in summer this will crack and cause rapid evaporation of moisture. The land should not be rolled when it is too hard and dry, else the rollers will cut the stems of the plants too much; but it should be rolled as soon as possible after rain, and when the plants are from 4in. to 6in. high.

Rainfall.—By Chairman, at Winulta—For June, 2·21in.; for half-year, 7·75in.; July, to date, 0·46in. By Mr. Hawke, Tiparra—For June, 2·12in.; for half-year, 6·83in.; July, to date, 0 24in.

Stockport, July 24.

Present—Messrs. G. Burdon (Chairman), D. G. Stribling, C. W. Smith, P. Hogan, J. F. Godfree, F. Watts, T. Howard, S. Smith, T. Megaw, J. Smith, jun., J. Smith, sen., S. Rogers, T. Murray (Hon. Sec.), and two visitors.

Suggestions for Congress.—It was resolved to bring under notice of members, at next Congress of the Bureau in Adelaide, the questions of "Annual Farmers' Holiday, and Excursion Fares on Railways in connection therewith;" and "Reduced Rates on Carriage of Fertilisers."

Mice in Stacks.—Mr. C. W. Smith directed attention to a device for keeping mice out of stacks by building in sheets of iron at about 3ft. from the ground.

Paskeville, July 20.

Present – Messrs. A. C. Wehr (Chairman), H. Koch, A. Goodall, J. C. Price, F. Bussenschutt, A. Bussenschutt, J. H. Nankervis, G. Bammann, W. Westphall, J. Bussenschutt, T. Trebilcock, W. Ayles, G. Miers, A. Palm. W. S. O'Grady (Hon. Sec.), also J. W. Taylor (Kadina Branch), and two other visitors.

Standard Bushel.—Mr. Goodall considered the present method of fixing the annual average weight of a standard bushel of wheat to be very unsatisfactory, as the farmers had no say whatever in the matter, and the average was fixed so late in the season that a good deal of the wheat was delivered before the new standard came into operation. This left the farmers no chance to clean their wheat up to the standard. The merchants ought to offer more inducement to produce good samples. If the standard were fixed at the average of the colony, by merchants and representatives of the producers conjointly, and the buyers dock one half-penny or more per bushel for every pound weight below the average weight, then they ought also to advance proportionately for every pound above the standard weight. This would encourage farmers to bring their wheat up to the highest degree of excellence. Mr. Taylor gave an instance of the unfairness of the present system. Last season, agents ten or twelve miles inland were permitted to give a penny per bushel more for wheat than those at the port, notwithstanding extras for carriage, &c. The explanation given was that the coastal wheat was lighter. If the agent had power to pay for wheat according to a scale on the standard, this wholesale reduction need not have been made. Mr. Price said at one time South Australian wheat used to fetch 2s. to 3s. per quarter above foreign wheats in the English market, but the prices given now were about the same amount below them, so that it would show that our wheat were deteriorating. If the standard were made higher than at present, it would compel farmers to clean their wheat better. The other members did not agree with this statement. Mr. Koch said the lower price paid for Australian wheat was due to its being mostly of the soft white varieties, whilst the American and other varieties that fetched better prices were what were called "flinty," and not in favor with our millers; but bakers had discovered that a bag of flour from flinty wheat contained more gluten and produced considerably more bread than the soft-wheat flour.

Golden Grove, July 20.

Present—Messrs. T. G. McPharlin (Chairman), J. Woodhead, J. Ross, H. P. Day, H. Bowey, J. R. Smart, F. Buder, A. Robertson, A. Marr, and R. Smith.

HORSE-BREEDING.—Mr. Woodhead read a paper to the following effect:—

> Horse stock being now more valuable than of late, it is well to discuss this subject. There are two classes of horses which it seems to be desirable to raise—good draught horses and roadsters. To do this more attention must be paid to the class of mares. It is of no use to have a good entire if the mares are only middling, as a great deal depends upon the mare. When farmers breed their own horses the stock is most likely to have good temper and be uniform in character, &c. To produce this kind of stock choose a mare of medium height, well put together, with good head, neck, and back, well sprung ribs, nicely turned hind quarters, flat bone, plenty of muscle, and, above all, good sound feet, and a fair amount of hair on the leg. Put her to a suitable horse and the result will be highly satisfactory. The stallion should be of mature age. It is a mistake to breed from a young entire with an old mare, or *vice versa*. The stallion should be of good carriage, a good walker, well put together, plenty of bone and muscle, a fair amount of hair, and a good constitution. Up to within a week of foaling the mare may do light farm work without hurt—such as ploughing and seeding—but she should be kept on the outside of the team. To do justice to the foal the mare should not work until the following seeding time, when the foal can be weaned. This is a very critical time for the foal. It must not be turned out to take its chances with the rest, but should be kept in a well-sheltered paddock and be well fed until next spring, when it will do very well as long as the grass is good. Do this for the following two seasons and the animal will be worth all the trouble. In regard to the stallion, it is not advisable to breed from your own stock if it is possible to get a good horse outside; but, as pedigrees are often "built up," it would be better to breed from your own horse than to use another about which there may be any reasonable doubts.

Members generally agreed with the paper, but Mr. Ross would prefer breeding from a dry mare. Mr. Woodhead advocated breeding from the mare every year, but not commencing too young or carrying on till she is too old. Mr. Smart had observed that the foals generally agreed neither with the sire or dam, but bred back.

JUDGING AT SHOWS.—Members discussed the question of single judges *versus* three judges at shows, but concluded that it would be best to retain the three judges.

Clare, July 14.

Present—Messrs. J. Christison (Chairman), H. Carter, H. J. Yelland, W. Kelly, W. S. Birks, W. Kimber, J. Treleaven, C. J. McCarthy, and J. H. Hague (Hon. Sec.).

OFFICERS.—Mr. J. Christison was elected Chairman and Mr. H. J. Yelland Hon. Secretary.

EXHIBIT.—Mr. Treleaven tabled 4lbs. wheat, the produce from sixty grains selected and sown last year. The sample was very good, and the yield was at the rate of 73bush. per acre. Mr. Christison showed a limb from an apple tree, the ends of the shoots having died back quite a foot. A large number of trees in this district are affected in this way. Various reasons were suggested, such as unsuitable stocks, deficiency of something in the soil, and exposure to the fierce heat of the afternoon sun in summer. The latter was generally believed to be the cause, and some growers propose to protect the stocks with boards, straw, or bagging.

TUBERCULOSIS.—Mr. Yelland read a lengthy paper on this subject. The following is an abstract:—

> This disease is dreadful, and should be much more carefully enquired into by dairymen, whose interests are liable to be seriously affected by it, as the milk is affected by the tubercular germs, and thus would communicate the disease to the consumers. Tuberculosis is very difficult to diagnose in its early stages, and it may remain undiscovered in a beast for twelve months, and thus may spread infection to other animals, including human beings. A beast had been killed which appeared perfectly healthy, except a dullness and a slight discharge in the eyes; but, when opened, her intestines were completely covered with nodules of tuberculosis. In the lungs it often takes the form of phthisis; in the intestines it is often called the scouring rot. It takes a multitude of forms, sometimes like rheumatism. The mammary (or milk) glands are very commonly affected. The disease is not hereditary; but the tendency may be hereditary—that is, the physical condition of the animal may not be strong enough to resist the attack of the microbes which cause the disease. These germs can be killed in milk by submitting it for three minutes to a temperature of 190° Fah. [Mr. Yelland then read the paper presented by Mr. J. McLeod to the Port Elliot Branch, on April 2, 1899, in which he closely described the symptoms of the disease, and the *post mortem* appearance of the animals.—GEN. SEC.].

Brinkworth, July 21.

Present—Messrs. S. Aunger (Chairman), A. W. Morrison, C. A. Horne, W. H. Pearce, J. F. Everett, J. Stott (Hon. Sec.), and four visitors.

SHEEP.—Mr. W. H. Pearce and Mr. J. F. Everett each read a paper on "Sheep." Both considered Merinos best for this locality. They save the butcher's bill, utilise the weeds, keep fallow clean, do not puddle the ground or knock fences about as cattle do. As wheat is so low in price, it will pay to raise early lambs for market and for export, and to use fertilisers with the drill, so as to get a much larger return from a smaller area, and thus liberate more land for pasturage. By growing more hay for the working stock, there would be a still larger area of land for grazing purposes, and the use of fertilisers on the cultivated land would increase the growth and nutritive value of grass, &c., in the succeeding years. It will probably pay better to buy middling old ewes from a station to throw one or two lambs, than to purchase young ewes, which are often culls. Progeny of sheep transferred from a station to a farm are larger-framed and generally superior to the station bred sheep. Good sheep-proof fences should be erected, and if cattle-proof also, they will require five plain and one barbed wire. The sheep should not be purchased from a run infested with noxious weeds, else the farm will suffer. The paddocks should contain several kinds of herbage, as sheep like a change of food, and thrive better on it. Water should be readily accessible, especially during the hot weather, and be not too close to the dwellings or outhouses, as sheep will not resort to such places until nearly famished. Mr. Pearce questioned whether it is advisable to raise crossbreds, as the percentage of deaths of lambs and ewes is greater, time is lost in looking after them, and he supposed the larger sheep require a proportionately larger quantity of feed. Mr. Everett advocated full-mouthed large-framed ewes from station just after shearing, crossed with Lincoln or Shropshire rams, if lambs are to be reared for market. He preferred Shropshire rams. He would place the rams with the ewes about Christmas, because, if lambs are dropped about the end of March, or beginning of April, there would probably be no young grass, consequently the lambs would be stunted, and the best of feed later on would not bring them up to the standard in time for market. By mating about Christmas, the lambs would be ready for export by October, and would be dropped at a time when there is usually a nice lot of green feed. For export, they should be about 35lbs. Say 150 ewes were bought, just off the shears, at 7s. = £52 10s.; an increase by lambs, 120, at 7s each, would give £42, and the 30 dry ewes would make good mutton, whilst the lambs were growing. Then the 120 ewes should give 7lbs. wool each—840lbs. at 5d., equal to £17 10s., or a total of £59 10s. over and above the 120 shorn ewes and the 30 dry ewes used or sold as mutton. As a rule, but with a few exceptions, it would not pay farmers to buy sheep to fatten only and to sell again.

HOMESTEAD MEETING.—This meeting was held at Mr. Everett's farm, where the members were hospitably received by the host and hostess.

STANDARD BUSHEL.—Mr. A. L. McEwin wrote *re* General Secretary's note on this question as discussed at meeting in April last:—"The members did not misunderstand the matter, as they are fully aware that wheat is always sold as 60lbs. for a bushel. The gist of opinion was that the standard weight of wheat was alright as at present fixed, though there were some who dissented. The dissatisfaction was in regard to the docking; for instance, if the standard average weight of a bushel of wheat for the season is fixed at 63lbs., so long as a measured bushel weighs 63lbs. the farmer receives the full market price; if it weighs only 60lbs. the farmer is at once docked 3d. per bushel; but if it weighs 66lbs. he receives no more than the full market price." Members were agreed that if wheat were worth 2s. 6d. per bushel because it weighed 63lbs. in the measured bushel, and was worth only 2s. 3d. when it weighed 60lbs. in per measured bushel, then it should be worth 2s. 9d. per 60lbs. when it weighed 66lbs. in the measured bushel; and it was thought that if a scale of this kind were adopted, farmers would be induced to thoroughly clean wheat.

Minlaton, July 22.

Present - Messrs. J. McKenzie (Chairman), James Anderson, D. G. Teichelmann, R. Higgins, John Anderson, A. McKenzie, J. Martin, J. D. Mayer, J. H. Ford, M. Twartz, Jos. Correll (Hon. Sec.), and one visitor.

WEAR AND TEAR ON SEED AND FERTILISER DRILLS.—In response to request of General Secretary this matter was well discussed. Very little land in this district can be classed as "clear" land, most of it being stony or stumpy. Messrs. J. McKenzie and J. Martin had obtained a drill between them, and used it for three seasons. The tyres had been cut and shut once, and two or three cones had broken, but the cost for repairs had not exceeded 15s. Mr. A. McKenzie had also used a drill for three seasons, putting in about 900 acres in all. He had broken a few cones and had new tyres put on, at a cost of about £1. Other members had as yet been to no expense for repairs. Messrs. Correll Bros. had had very few breakages. Some members thought the wheels should be made stronger, and larger axles provided. After considerable discussion it was agreed that for the first three or four years 5 per cent. on clear land, and 7½ per cent. on rough land, such as the average of this district, was enough to write off annually for depreciation when the drills received proper care and attention.

INSECTIVOROUS BIRDS.—Some discussion ensued on crows and other birds. Some members could not say a good word for the crow, which, in their opinion, did much harm and no good. Mr. J. Anderson had noticed a flock of crows on a patch of ground badly infested with grubs, and considered they did good service in eating them. The Hon. Secretary considered that magpies, crows, plovers, and other birds could be numbered amongst the farmers' best friends.

He had often watched magpies and crows on grub-infested spots rooting up the grubs. The crow did far more good than harm; ground that was badly infested by grubs last year had been cleaned by the birds.

OFFICERS.—Mr. J. McKenzie was elected Chairman, Messrs. M. Twartz and J. H. Ford Vice-Chairmen, and Mr. J. Correll Hon Secretary.

BLACKSMITHING ON THE FARM.—Mr. J. McKenzie read a paper on "Every Farmer his own Blacksmith," to the following effect:—

In taking up this matter he did not wish to reflect on the professional smith, but would look at it from the farmers' point of view. All farmers know that with small returns from their crops, and low prices for produce, the man who wishes to make both ends meet must keep down expenses as much as possible, and that, if all repairs to implements are sent to the blacksmith, the yearly bill becomes an important item, besides loss of time while implements are undergoing repairs. The outfit required by the farmer who intends to do most of his own smithing need not cost more than £10 to £12. It will consist of bellows, anvil, vise, screw-tackle, two or three different-sized hammers, and two or three pairs of pincers, cold chisels, punches, and other tools can be made by the farmer himself. Useful scrap iron can often be picked up cheap at sales, and this, with a few bars of iron, a handy man can save at least £12 to £15 per annum. Then every farmer knows that at harvest time he may lose pounds worth of time over a shilling job if he has to go to the blacksmith for every trifle. It is not unusual, owing to other people wanting their implements repaired at the same time, for the farmer to be delayed half a day over a job that he could do at home in ten minutes if he had the conveniences. Then also, as long as the implements will hang together during the busy times, you cannot afford to lose the time necessary to take them to the smith's for repairs, consequently when they refuse to work they are almost beyond repair. If a few minutes are spent in repairing the implement directly anything goes wrong, it will last longer and cost much less in the end. He considered that farmers who did not do their own smithing lost all round, both in time and money. Better work and more profitable returns result where the implements are kept in good repair. Then an industrious man does not like to be idle when it is too wet or otherwise unfit for work out of doors. If he has a shop and a few tools he can put in these odd days making gate hinges, eye-bolts, S-hooks, and a hundred and one little things required on the farm or for the improvement of the homestead. If he had to pay for such work he could not in most cases afford to have it done, the result being that they sometimes saw gates and slip-panels fixed up with wire or binder-twine, which is not only an eyesore to a thrifty man, but a constant source of trouble. When opening and closing such gates, &c., you will often get a nasty scratch, and perhaps tear your clothes, which is a more serious matter still, as the first will heal, but the other will not. Every farmer his own blacksmith does not mean that he should do all his own repairs. With the tools mentioned he could not manufacture ploughs or harrows, or build wagons, neither would it pay him to attempt such work which required tradesmen with skill and experience. One of their principal blacksmiths told him that the farmers who did the little jobs for themselves were really his best customers. When a man goes out to chop posts in the scrub he takes a stone with him to keep his axe sharp if he has any regard for his time and labor, and so should the farmer have the tools at hand to keep his implements in good condition. In conclusion, he would say that, however much machinery and implements farmers may have, to take the best care of them, and get the most use out of them, and to use their farms generally to the best advantage, it requires that every farmer should be his own blacksmith.

A short discussion ensued, members generally agreeing with Mr. McKenzie.

Meningie, July 22.

Present—Messrs. M. Linn (Chairman), R. M. Scott, W. J. Batten, W. Robinson, T. W. R. Hiscock, W. Yates, W. Tiller, H. May, J. Williams, and H. B. Hacket (Hon. Sec.).

CO-OPERATION.—Paper read at previous meeting by Hon. Secretary was well discussed. Mr. Williams thoroughly agreed with the objects of co-operation. He had tried to make the local creamery a co-operative concern, but, either through ignorance of its benefits or suspicion that someone would get more than a fair share of the profits, nothing came of the matter. He believed in co-operation for producers, and was sure no one would go wrong in supporting the principles. The Chairman considered co-operation very necessary, but it must be established on a large scale. Mr. Tiller agreed, and considered that with a proper system of co-operation the producer would obtain better values for his produce, while the purchasing power of the consumer would be increased. He thought the dairy farmers should establish a large co-operation, with a main depôt in Adelaide for storage and sale of produce. The co-operation could ship direct to the Manchester Co-operation, and could also purchase dairy requisites through that agency, and so place them in the hands of the farmers at reasonable prices. He quoted several lines on which, in his opinion, the middleman charged an excessive profit. Under the co-operative system there would be no desire to take anything more than a fair profit from the customer. Other members agreed, and it was decided to offer a paper on co-operation for discussion at Congress. The subject of sand drifts was also suggested for discussion at Congress.

POTATOES.—Mr. H. May tabled splendid samples of White Elephant potato grown on well manured sandy soil. They were planted about end of October and dug in January. He had tried planting during every month of the year, but found that about the end of October and beginning of November was the best time for this district. He gave the crop four good waterings.

CODLIN MOTH.—Mr. Tiller considered the prosecution of hawkers for sale of codlin moth infested fruit a mistake. It was a matter of impossibility to get rid of this pest. Other members agreed.

Koolunga, June 21.

Present—Messrs. T. B. Butcher (Chairman), R. Lawry, J. Jones, J. Sandow, G. Pennyfield (Hon. Sec.), and two visitors.

SHELTER FOR STOCK.—Mr. Jones considered that no better shelter for stock than a good stack of straw could be provided.

SOURSOPS.—Mr. Jones stated that he tried to destroy this weed by hoeing it up, but it appeared to grow thicker than ever. He then covered the patch with salt, which had the desired effect.

Meningie, June 24.

Present—Messrs. M. Linn (Chairman), T. W. R. Hiscock, W. J. Batten, A. J. Myren, W. Yates, C. J. Shipway, and H. B. Hacket (Hon. Sec.).

CO-OPERATION.—The Hon. Secretary read a paper on this subject, which was shortly discussed.

Amyton, July 20.

Present—Messrs. H. Turner (in chair), J. Kelly, Jno. Gray, W. Gum, Thos. Gum, W. Mills, W. Hawke, Jas. Gray, H. Gray, S. Thomas (Hon. Sec.), and two visitors.

THE AGRICULTURAL OUTLOOK.—Mr. Jno. Gray read a paper on this subject, as follows:—

In dealing with such a large subject as this, one cannot be expected to confine his remarks to the outlook of agriculture for his own district. As far as this district is concerned, our experience during the last five years has made us painfully aware that everything depends upon the annual rainfall, and we have simply to work on and live in hope that the years of abundance that we have known will repeat themselves. Then, possibly, the various farm industries that were at one time fruitful sources of profit, but which the years of drought have crippled to a most lamentable extent, may be taken up again. My purpose in this paper is to suggest a few channels into which the farmer's energies may be directed with a fair prospect of success. The first questions by every farmer should be—What can I produce?

and how can I find a market for my produce? As in every other branch of trade or industry it is the market or demand that leads to production, I have, therefore, to deal with the production and marketing of farm produce. No farmer needs to be reminded that during the last twelve or fifteen years the value of his produce has fallen very considerably. Another question that is naturally uppermost in the agriculturist's mind is, how can he go on producing and hold his own? The unfortunate position of the majority of farmers is that they are so placed that they have to accept whatever price is offering at the time their produce is ready for market. One would naturally think that those who are engaged in first production would be the wealthiest, but it is not so. This thought by the way, as it does not come within the scope of this paper to inquire into the reason of this anomaly. While there has been a great fall in the value of agricultural produce, it has not been all loss. By the introduction of improved implements and machinery there has been a corresponding reduction in the cost of production. Indeed, the far northern farmer will, I think, in the near future, if he is not doing it now, lead the van in the matter of reducing the cost of production. Such have been his straits during the last few years that he has been compelled to economise in every direction. He has learnt what a wonderful amount of work can be done by judicious thought and scheming. So far, to a large extent, he has had to be content with the old style of implements; as soon as he is in a position to avail himself of the later inventions wonderful strides will be made in lessening the cost of production. With the advent of the paring or skim plough will come a revolution in the construction of ploughs generally. To my mind, in the skim or paring plough we have the true principle of a plough, suited at any rate to most of the north country. In the steel share, cutting the full width of the furrow; the short turned board, that does not drag on the bottom of the furrow, and which in wet weather carries the least possible amount of dirt, and the plough carried on four high wheels, we have, I believe, the acme of perfection, combining lightness of draught with effective work. Such an implement is suitable for doing the work of an ordinary plough or for skimming the surface lightly. The seed and fertiliser drill is another implement that has introduced a wonderful change and great advance in methods of tilling the soil, especially in those parts where the rainfall is more certain. No better proof of the beneficial effects of the use of fertilisers can be given than the increasing quantities that are being imported and manufactured locally. Whether it will pay to use artificial manures in the drier northern areas is still a matter to be decided by experiment. I feel very confident that the use of manures, as now being extended in districts having a more reliable rainfall, will very materially raise the wheat average of the colony, and put money into the pocket of the farmer who takes up the advanced method. Then the introduction of the binder has very much reduced the cost of handling hay crops, and has enabled the user to save a very great deal of straw in a condition and at a cost that is profitable. There is no doubt that if the binder had been introduced twelve or fifteen years ago, and as extensively used as it is now, and undoubtedly will be in the North when there are the crops fit to be handled by the machine, the great loss of stock that took place two or three years ago would not have happened. Of course, with the use of the binder I couple the header and thresher. I believe the cost of saving the straw by this means will be about 7s. or 8s. per ton. It costs nearly as much to save straw by means of the horse rake after the stripper has done its work, and of course for feeding purposes there is no comparison between straw saved by the use of the binder and that saved by means of the horse rake. Then, during the last ten years a great improvement has taken place in the South Australian farmer's old and reliable friend, the stripper. Now we can get a machine, light of draught, doing effective work and easy to handle. The same also may be said of the winnower, both hand and horse-power. Before passing from this part of my subject I may mention another matter that has an important bearing on farm work, that is, the size of the team that can be handled. My experience is that a man, if he has nothing else to occupy his attention and has a handy arrangement for feeding his horses, can work comfortably from ten to twelve in a team while ploughing and harrowing. Any handy boy can drive twelve horses in a plough. I have driven as many as sixteen horses in a plough, and found them as easy to drive as an eight-horse team. By driving larger teams there is the advantage of having extra labor set apart for looking after other branches of industry. On a farm where it has been usual to drive two six-horse teams, by putting both teams into one the extra hand can be set to do other work. Thus, in the matter of production, in view of the low value of produce, by the use of improved implements and machinery, thus facilitating better and more economical production and handling of produce, the prospect for the farmer is fairly satisfactory. The productions of a farm should comprise wheat, wool, mutton, butter, beef, pork, eggs, and poultry of all kinds. Wheat must always be the staple product. It is the easiest plant to cultivate on a large scale, and the hardiest. Where the holding is limited the by-products of the farm depend on the cultivation of wheat. Through its cultivation more feed is grown for cattle and sheep, and the necessary fodder saved for the proverbial dry time, whether it be the autumn months of an ordinary year or time of prolonged drought. Then the offal from the wheat crop is a great help in keeping pigs and poultry. The making of ensilage is a matter every farmer can turn his attention to profitably, especially now that butter factories and creameries are being established in almost every district of the colony. Greenstuff of any kind loses quite two-thirds of its weight when made into hay; that is to say, 3 tons of green wheat or wild oats will make about a ton of hay. The daily ration of ensilage per cow per day will be about 60lbs. At this rate 3 tons of ensilage, the quantity of stuff required to make a ton of hay, will feed a cow for 112 days. A cow so fed ought to produce 1lb. of butter per day, say 112lbs. for the 3 tons of ensilage consumed. This quantity of butter at 7d. per lb. would be worth 65s. I am making this estimate, I think, on a low basis. If butter is only worth 7d. per pound, the milk will not be worth more than 2½d. per gallon; and I think an average cow ought to make 7lbs. of butter in a week, fed on as much greenstuff as she can consume. Time and space forbid me saying more on this matter; I will only add that a very great quantity of wild oats is cut every year for hay, which makes very poor feed for working stock, but which if turned into silage would be very valuable fodder for cows, pigs, and even sheep. I think I have shown that the making of ensilage is a matter worthy the attention of every farmer; I believe it to be the only way the dairy industry can be profitably and permanently established in the North It is now thoroughly recognised that poultry is a profitable branch of farm industry. Given proper attention and the right breed, I believe it will pay to feed on wheat, taking the average price during the last ten years. And in regard to pork, its production can be made profitable by the use of ensilage and pig-proof paddocks, using grain only for topping up; by this means I believe pork can be produced and sold at a profit for 2d. per pound. Another line that can be profitably taken up is the raising of lambs for the English market. The drawback in this matter is that lambs have to be dropped in the months of April and May, just the worst time for feed; and in order to have the lambs large enough by the time of shipping the mothers and the lambs must not be stunted. In most cases artificial feeding would have to be resorted to, and as milk has to be produced the practice of making ensilage would have to be adopted. I have had no experience in this matter, and do not speak with authority, but I am strongly impressed that it can be made profitable. Last year over 30,000 lambs were exported through the Government freezing stores, and netted to the producers from 8s. 6d. to 12s. 6d. per head, or an average of about 11s. In reference to this matter Mr. G. S. Kemp, of Mintaro, says:—"Lamb-breeding will pay the farmer handsomely, even though prices should rule considerably lower than was the case last season." Ten shillings or 11s. is undoubtedly a good price for a four or five month old sheep. This is a matter well worthy the attention of small farmers. In the matter of markets for farm products now, as compared with, say, ten years ago, the outlook is eminently satisfactory. A wonderful advance has been made in the transporting of perishable products to distant markets. By this means the markets of the world are practically brought within reach of the farmer, however remote he may be from such market; and nearly all our products are finding their way to the consumer in England. Most of these products too are sold there at a price that is profitable to the producer here That at any rate is the case with our perishable products. In the matter of marketing of those products that are not perishable, such as wheat and wool, and especially in the case of wheat, which seems to fluctuate more than anything else, the question of holding when the price is very low is worthy of serious attention by our farmers. By stacking wheat in the open air, on a raised mouse-proof floor, it can be kept for many years free from weevil and damage by mice. Of course the financial consideration prevents this being done on any large scale; still, I believe more might be done in this direction by individual farmers who have sufficient financial strength, and unitedly by strongly supporting our own Farmers' Union, so placing it in a position to be able to make large advances on wheat stored in its hands. It does seem a pity to part with wheat at about 1s 11d per bushel, when by holding a twelvemonths or so 50 per cent. more can be obtained. Of course there are difficulties ahead of the farmer. New weeds in the land and diseases in stock have to be combated, and changing conditions of markets have to be watched and studied. It is always wise to have several baskets for one's eggs; if one happens to get upset all is not lost; so it is wise not to put all one's energies into one channel on the farm. It generally happens that when one thing is depressed something else is paying, and every branch of farm work is subject to ups and downs, and will emerge from a depressed condition sooner or later. So it is always wise to keep plodding on, and then be continually in a position to reap when the tide turns. Putting all things together, I do not think farming is played out in South Australia. The lessened cost of production ameliorates to a great extent the fall in the price of wheat, and access to the English markets enables the farmer to engage with some degree of safety in the minor industries of the farm. One thing that is essential to success is cheap land. Seeing that in order to cope with changing circumstances it is necessary to adopt improved implements and machinery, some of which are expensive, the farmer cannot afford to pay high prices for his land. Of course, while preparing this paper I have not been unmindful of the fact that for the last five years farming in this district has been carried on at a tremendous loss. I assume that wheat-growing can be made to pay; if it cannot then it is useless going along the lines I have indicated. One thing I feel sure of, if the conditions I have indicated in reference to machinery and markets were the same ten years as they are to-day, and we as farmers had taken advantage of them, we would have been in a very much better position than we are; though of course I do not say we could have made our farm work pay during the time of disastrous drought, we might have held our own. I think the outlook at present is to so work that we will be able to reap the full benefit of the good seasons when they return, as they undoubtedly will.

Members generally agreed with Mr. Gray, but two or three members thought pig-breeding in this district would not pay, as it was necessary to treat the pig as a grazing animal to get any profit; but grass was too uncertain in this district to be relied upon. Mr. W. Gum considered the estimated return from well cared for cows rather low. In regard to storing wheat, he stated that he had placed some boards on four kerosene tins and kept four bags of wheat and two of flour free from mice for several months. Mr. Turner spoke very highly of the paring ploughs, but thought a larger board was needed to turn all the soil, as the small boards spilled too much.

PROGRAMME.—A programme of subjects to be discussed during the ensuing year was drawn up. Several members volunteered to take certain subjects, and others were allotted one each.

Koolunga, July 19.

Present—Messrs. T. B. Butcher (Chairman), J. Jones, J. Button, J. Butterfield, R. H. Buchanan, E. J. Shipway, J. Freeman, W. J. Jose, A. Craig, R. Jackson, W. T. Cooper, R. Lawry, G. Pennyfield (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary reported that thirteen meetings had been held during the year, with an average attendance of ten members, and a fair number of visitors. Papers on "Milk Yields and their Butter-fat Values," "Best Method of Cleaning the Land and Preserving the Fertility of the Soil," "Ensilage," and "Co-operation," had been read. Amongst the principal subjects discussed, in addition to these papers, were "Best Three Varieties of Wheat for the District," "The Dairy Instructor's article on 'Dairy Cattle,'" "Farmers' Relief Fund," &c. Two "question box" meetings had been held, and visits arranged for Professor Lowrie and the Dairy Instructor, both of whom had given instructive addresses. The loan of a Jersey bull had been secured from the department, and generally the results of the year's work had been satisfactory. The officers were thanked for their services and re-elected.

PROFIT ON PIGS.—Mr. Jones was of opinion that it would be profitable to feed pigs on inferior wheat rather than sell it at a reduced price. Members were of opinion that if farmers could allow their pigs to run out they would be more profitable than if shut up and fed on grain.

MANURES.—The Chairman referred to the cost of fertilisers. Their use was so much on the increase that the question of a local supply of good cheap manure was of the utmost importance to farmers, and instanced the heavy expenses for freight, &c., on fertilisers imported from Europe. The Secretary read article from the daily press on "Sulphuric Acids and Manures."

Forster, July 24.

Present—Messrs. J. Johns (Chairman), J. Sears, F. C. R. A. Schencher, A. Retallack, J. D. Prosser (Hon. Sec.), and five visitors.

EXHIBIT.—Messrs. Johns Brothers tabled two turnips weighing 8½lbs. and 7¼lbs., and measuring 32in. and 30½in. circumference.

HINTS FOR FARMERS.—Mr. Joseph Johns read a paper. No farmer should have more than 660 acres of good land, which would enable him to crop 220 each year, all fallow. He favored Tyler ploughs for covering up the weeds, and Tyler's scarifiers, Lutz harrows and strippers. He would harrow fallowed land to enable the scarifiers to cut the weeds better. The best class of horse for farmers is from a roadster horse and a draught mare, giving an animal with a heavy body, light legs, and plenty of life. When working, give them linseed, which will prevent trouble with sand. Not less than 15 tons of hay should be provided. Boiled wheat and pollard is the best short feed for horses, except, perhaps, crushed oats. The man who tries to work 300 acres with one team will soon grow grey.

Orroroo, July 21.

Present—Messrs. J. Moody (Chairman), J. Jamieson, W. S. Lillecrap, S. Roberts, E. D. Kirkland, E. Copley, R. Coulter, jun , and T. H. P. Tapscott, (Hon. Sec.).

SEED DRILL V. BROADCAST SOWER.—Paper on this subject read by Mr. Coulter at previous meeting was well discussed. Most of the members were of opinion that the drill would not supersede the broad-casting machines in the dry areas.

Hawker, July 19.

Present—Messrs. S. Irvine (in chair), J. W. Schuppan, H. M. Borgas, F. C. Hirsch, R. Wardell, C. W. Pumpa, and J. Smith (Hon. Sec.).

FARMERS' RELIEF FUND.—Considerable discussion on this subject took place, and it was resolved that the Branch recognises the necessity for establishing such a fund, and suggests that two delegates from each farming district should meet and discuss the lines upon which such a fund should be established and how it should be administered.

CATTLE TICK.—Mr. Irvine tabled specimen of cattle tick.

EARLY WHEAT.—Mr. Irvine tabled sample of wheat 2ft. high and coming into ear. He intended to turn sheep into the paddock, as he considered it better to run the risk of the wheat growing again than to expose it to the almost certain chance of having it nipped while in bloom by frost.

Mundoora, July 21.

Present—Messrs. R. Harris (Chairman), W. D. Tonkin, W. Aitchison, J. J. Vanstone, W. J. Shearer C. Button, T. Watt, W. H. Mitchell, J. Blake, A. McDonald, D. Smith, and A. E. Gardiner (Hon. Sec.).

INSECTIVOROUS BIRDS.—The question of the protection of native birds was again discussed, and considerable difference of opinion existed as to whether the crow was the friend or the foe of the farmer. It was decided to discuss this matter at a future meeting. The Chairman was glad to notice that the Education Department had taken up the matter of the protection of our native birds.

DEPTH TO SOW GRAIN.—Mr. Aitchison said he had seen it stated that grain sown 5in. deep gave the best results. He had put some in this season at that depth, but so far it did not look so well as that planted shallower. He had also tried drilling in seed without any fertiliser, but considered broadcasting would give better results. Members thought that owing to the rain having fallen in light showers for the most part the deep sown grain had not received sufficient moisture. Mr. Harris differed from Mr. Aitchison in regard to drilling in seed without fertilisers. He had put some in and it looked better than the broadcast, though, of course, proper comparison could not be made until harvest. Discussion also took place on the different makes of drills, members pointing out the merits and defects of the various makes used in the district. This matter was considered to be of great importance, as the drills being very expensive it was essential that they should give satisfaction. The Hon. Secretary said his brothers hired three different makes of drills before they got one to sow the fertilisers satisfactorily, and they had purchased this one.

INFERIOR FERTILISERS.—Many of the members expressed dissatisfaction at the way in which they had been treated by some vendors of fertilisers. Many farmers in the district have similar complaints to make, it being alleged that much of the fertilisers arrived in bad condition, while some was of a very inferior nature, though advertised and sold as equal to English superphosphate It was also stated that the agreements signed by the purchasers early in the season, when ordering, were of such a nature that they had no remedy against the vendors. The Hon. Secretary urged the necessity for being careful where they obtained their requirements. Some of the firms referred to would certainly not receive further orders from many of their customers. [Similar complaints have been made in other quarters about this matter, and farmers are strongly advised to follow the recommendation of the Inspector of Fertilisers, and insist on the guaranteed contents of the fertilisers being stated on the orders which they sign.—GEN. SEC.]

Hartley, July 21.

Present—Messrs. A. Dalton (Chairman), W. Klenke, W. Kutzer, J. Jaensch, T. Jaensch, J. B. Sanders, H. Reimers, H. Lehman (Hon. Sec.), and two visitors.

FALLOW.—Mr. H. Lehmann, read the following paper:—

Fallow land is usually understood as land which has been prepared the year previous to seeding. This is a practice in farm work which every farmer ought to try and advance It is nonsense to say fallowing does not pay, but every farmer ought to do the best he can under the circumstances. In the first place we must study the nature of the soil. We cannot treat clay soils the same as the ashy and sticky soils Clay soils are often spoiled by ploughing when too wet and harrowing too wet, the result being that the surface becomes baked and hard, and when seeding time comes the land is strewn with clods, causing more labor than is necessary. In treating clay land the farmer must bide his time until the soil is fairly dry. By simply harrowing fallow land it is only the surface that is pulverised, leaving the bottom in its natural state. The ashy soils generally become well pulverised when ploughing, and it is then only necessary to treat half of that which is being turned over. It is most important, secondly, to keep the land free from weeds, but this is in many instances the drawback of a better harvest in not keeping the surface loose and free from weeds. The best time to fallow for this district is about August, when all the grass and weeds are well up. If land in its natural state is very loose it is not necessary to disturb much of this fallow land, it need only be kept free from weeds and the surface loose. It is a great mistake to allow fallow land to become caked on the surface even if the bottom may be fairly loose. In this district we should try and retain all the moisture we can in fallow land by keeping the surface loose. Caked top is the result of a dry bottom Clay land becomes too hard by working it too much, and the result is that the wheat grows very slowly in the early part of the season, and does not begin to grow well until the clay is well soaked. Clay land becomes very soft when well soaked, and soon becomes hard when the moisture leaves it. If fallow land is kept clean of weeds till seeding it is not at all necessary to skim-plough it. Skim-ploughing is generally done on weedy fallow. The seed drill is most useful for seeding fallow, especially when the land has been well prepared. When fallowing does not pay is when the farmer ploughs the land up cloddy and then jumps it with the harrows, and when seeding time comes he skim-ploughs it and jumps the clods again with the harrows, and then tries to make a good job of it by rolling the tough clods down and crushing the softer ones. He then leaves the field, and in a month or two he will see some patches becoming very green with different weeds or dandelions.

Mr. J. B. Sanders followed with a paper on the same subject, as follows:—

In fallowing land for seed the ground should be in good order for working, namely, wet, and the weeds well sprouted. The plough should be started some time at the end of July or the beginning of August. The ground should be worked not less than 6in. or 7in. deep where the land will permit it; the sod should be well turned, and the weeds well covered; then, about three or four weeks later, it should be harrowed and brought to a fine tilth, and left until October or until the weeds (if there are any) have started to grow. Then, while they are yet small, run the skimmer or scarifier over it about 3in. deep, or run sheep on it to keep them down. I do not believe in ploughing fallow back to put in the seed if the ground be free from weeds, which, if care is taken and it is well worked, it will be. I should run the scarifier over about 3in. deep, sow the wheat, and harrow it twice, once each way. I think, where there is an extensive dairy on the farm, it is advisable to grow a fallow crop, such as maize, sorghum, millet, or dhurra. These may be drilled in rows about 3ft apart to allow room for the horse hoe to be worked between them, thus keeping the ground loose and killing any weeds, which will help the fallow crop. This crop will be off in time to allow for a good scarifying before seeding time. It is my opinion that we will soon have to put in less acreage of wheat and put it in better, such as fallowing the land and attending to it properly, and only put in about half the wheat we now put in. It seems to be the idea now to rush in as much wheat as we can, by ploughing the land and sowing the seed, so as to get the required quantity of wheat; but would we not get quite as good results off half the land well worked and drilled in with manure, thereby saving the quantity of seed sown and a much less acreage to be reaped, therefore having the other left for grass. As for manuring the land, most of it wants it badly enough, as crops after crops have been taken off and nothing put back in return. If we keep on with this sort of farming it will not pay for the ploughshares used, and the ground will be so much run out of heart that it will be years before it can grow grass enough to feed anything.

The Chairman said fallow pays if well done and the land is kept free from weeds. Mr. Klenke thought that cropping the fallows with sorghum does not leave the land in a better state for seeding with wheat, and would rather weaken the land. The Hon. Secretary said he had grown sorghum on fallow, but did not see any benefit therefrom, as the wheat did not thrive any better; and it was difficult to grow millets, sorghums, &c., in this district, because the soil is too dry generally. Mr. Dalton said these plants ought to be grown on low-lying lands and gullies.

Riverton, July 22.

Present—Messrs. H. A. Davis (Chairman), W. Hannaford, D. Kirk, Thos. Gravestocks, M. Nash, F. M. Calf, H. Davis, and H. A. Hussey (Hon. Sec.).

ANNUAL REPORT.—Hon. Secretary read annual report. Attendances gave an average of nearly eight for thirteen members. One member had died, and another resigned. A number of practical papers had been read and many subjects discussed. A few cattle had been attacked by ophthalmia, and treatment prescribed, which had been effective. A pruning demonstration had been given by the fruit inspector.

OFFICERS.—Chairman and Hon. Secretary were thanked and re-elected.

SPALDING ROBBINS PLOUGH.—A trial of the rotary disc plough took place on Mr. Davis's farm on July 17 on various soils and on ploughed land. It did good work, and would be a good plough for a well-cleared farm, but cannot work on land that is stony or having many stumps.

JERSEY BULL.—The State bull, lent by the Department of Agriculture, is in good condition and doing well. Has not been used much, owing to being too young.

Redhill, July 24.

Present—Messrs. S. H. Treloar (Chairman), D. Lithgow, A. A. Robertson, W. Stone, R. T. Nicholls, R. P. B. Bayly, H. Darwin, F. Wheaton, D. Steele, T. McDonald (Hon. Sec.), and W. J. Venning (of Crystal Brook Branch).

FIELD TRIAL SOCIETY.—Mr. Venning advocated the continuance of the Field Trial Society amongst the Branches surrounding Crystal Brook, because great social and educational advantages are attached to such trials. He also urged co-operation in other directions amongst farmers.

Excursion Fares for Farmers.—Members are not prepared to advocate excursion trains for any particular class of people, but think that when excursion fares are granted the holders of tickets should be allowed to break their journey. Generally, when excursion fares are being run, the hotels and other places of accommodation are crowded, and, to avoid arriving in the crowded city at night, many country people would prefer to stay with friends on the way, or at some place near the city, and finish their journey down next day. Excursion tickets should also be issued to any station on the lines. Owing to these restrictions the excursion fares are not the concession to country people that they are thought to be.

Lipson, July 22.

Present—The Vice-chairman, Messrs. W. F. Darling, Chas. Provis, J. Wishart, Geo. Carr, H. Brougham, J. Brown, R. Haldane, and six visitors.

Salt Spots.—In a discussion upon the origin of patches of salty soil which have lately occurred in various parts of the district Mr. Carr attributed it to the destruction of the natural timber.

[This meeting sat for a very long time, but the above is the only item of practical information furnished in the report forwarded.—Gen. Sec.]

Elbow Hill, July 25.

Present—Messrs. H. T. Styles (Chairman), C. L. DuBois, W. Beinke, J. Elleway, H. Dunn, C. G. Ward, W. Spence, F. J. Brooks, E. Wake, W. Ward, J. Harvey, G. Wheeler (Hon. Sec.), and eleven visitors.

Turnip Weed.—Mr. C. G. Ward read a paper on "Turnip Weed and How to Destroy it." Someone had recommended the use of a little bluestone in water for the destruction of aphis on cabbage—not *too much*—and he had tried it, with the result that both aphis and cabbages had been killed. Turnip weed (or "charlock" or "wild mustard") being of same family he thought bluestone would be equally efficacious, so he tried 3lbs. to 100galls. of water. This affected the tips of the leaves only; then he tried 4lbs., 5lbs., 6lbs., and 7lbs. to the 100galls., with increasing deleterious effect, the last being apparently quite effectual. He tried 7lbs. bluestone in 100galls. of water on wheat and barley plants and it did not appear to injure them, although a week had passed since the application He thought 100galls. would be sufficient for an acre and that it could be applied with a broadcast sprayer. Members agreed that turnip weed is a useful fodder, but is a pest in any cereal crop.

Domestic Dogs.—Mr. Elleway said that in such a vermin-infested district as this there ought not to be any tax imposed on domestic dogs, as they were the best means of keeping the rabbits down. Several members agreed, and a resolution was arrived at requesting the Franklin Harbor District Council to refrain from levying a tax on domestic dogs.

Bluestone, Test of.—Mr. C. L. DuBois read a paper showing a simple test of the purity or otherwise of bluestone. If pure, it is a certain specific against bunt in wheat and other cereals; but it is adulterated with (or substituted by) sulphate of iron or copperas, which is only one-eighth of the money value of pure bluestone, and is of little effective value for the prevention of bunt. Adulterated bluestone will still show colors of copper on a knifeblade left in the solution for a time; but Professor Woodward, lecturer on chemistry at the Aukfield Agricultural College, England, has discovered a very simple test that can be used by any farmer. If a decoction of tea is poured into a solution of sulphate of iron the mixture takes a black color, and a flocculent precipitate is thrown down; but when the tea is poured into a solution of sulphate of copper the change is but slight, and the mixture changes to a brown or dirty olive color, which cannot be confounded with that of the sulphate of iron. If a more accurate test is desired, put a teaspoonful of dry tea into half a pint of boiling water; then dissolve a teaspoonful of the sulphate of iron or sulphate of copper it is desired to test Pour some clear water into a tumbler; put into this a teaspoonful each of the tea and of the sulphate solution. If the sulphate of copper is adulterated with sulphate of iron a black tinge will pervade the mixture; if it only becomes brown or a dirty green there is no iron present. If a comparative test is required, dissolve a teaspoonful of known pure sulphate of copper into a pint or water, and in another vessel dissolve a teaspoonful of the suspected material in a pint of water (do not use metal vessels). Set two tumblers on a sheet of white paper in a good light, fill with pure water, add tea water until both are exactly of the same color. Then in one put a teaspoonful of the doubtful solution, and in the other the pure solution. If there is only a small proportion of sulphate of iron in the doubtful solution it will make the tumbler of water look like watered ink—even a 2 per cent. adulteration can be easily detected. In answer to questions, Mr. DuBois said the presence of iron sulphate in bluestone does not damage the sulphate of copper, but it does weaken it, so that the bluestone cannot be effective in destroying the spore of bunt.

RABBIT DESTRUCTION.—The Hon. Secretary and Mr. Dunn have been very successful in destroying rabbits in burrows with bisulphide of carbon. Mr. DuBois had better results from burning sulphur in the burrows; but at present he was trying netted hurdles around the burrows and poisoning inside. Mr. Brookes said that phosphorised pollard had done better than anything he had tried. He thought bisulphide of carbon was very good, but was too slow where rabbits are numerous.

BLINDNESS OF FOWLS.—In answer to question, Mr. DuBois advised washing the eyes of fowls affected with blindness, and then anointing with carbolic oil or a solution of Epsom salts.

Port Pirie, July 20.

Present—Messrs. P. J. Spain (Chairman), T. A. Wilson, E. J. Hector, T. Gambrell, G. Hannan, T. Jose, G. M. Wright, H. B. Welch, F. Humphris, and R. J. Ferry (Hon. Sec.).

"DAIRY COWS: BREED *v.* FEED."—Mr. A. Wilson read a paper under this heading. The following is a short abstract:—

Those who carry on dairying on any scale should secure not only the latest up-to-date appliances, but also keep the best cows and feed them with the best food available. The reason why many people fail or make but little profit with cows is that they keep cows which do not pay for their food. The question of feeding cows with anything that is not found growing naturally on the pastures does not occur to them, and very few owners figure up the cost of food and the value of the returns per cow, and they are mainly unaware of what their cows individually do produce. All cows should be tested thoroughly in regard to their butter-producing capacity. The question should be "Can we afford to keep a cow that does not return a margin over the cost of her keep and labor expended?" It is surprising what a number of mongrel and unprofitable cows are maintained by various farmers. Each cow should produce at least 200lbs. to 250lbs. of butter and 500galls. to 600galls. of milk yearly. It must be decided whether it would pay to keep cows that fall below that. Having a knowledge of what each cow consumes and produces, the owner can readily set to work to find out the cows that fall below, and to settle the question whether feed or breed will bring the herd up to the standard. The opinion has been advanced that cows are like machines, and will return what is put into them, but that is true only to a certain extent. It has its limit—in some cows soon reached. A cow is at her best after her third calf, and is then capable of producing a certain quantity of butter, and no matter how she is fed she can not give beyond that. It is, of course possible, by judicious feeding, to increase the quantity of milk, but not beyond a certain point, and the successful man is he who knows just what quantity of "artificial" food produces that result, and that to give more would be a waste of food. The quantity of dry food required to sustain life in a cow is generally placed at 16lbs. daily, and the question remains "Does she produce enough butter to pay for the food given over and above that quantity, and for the labor added?" If not, then the dairyman cannot afford to keep that cow. As to which foods are most profitable must depend upon local circumstances. If pastures are good, aided by lucern or clover, or with hay, chaff, and bran when these are scarce, it may not pay to buy cake and other artificial foods, or to grow roots, or to make ensilage. He had known green sorghum chaffed and fed with bran to double a milk yield, but the resulting butter was rather too sweet. Whatever the nature of the food given, the quantity of milk can only be increased up to a certain varying point in each cow, and it is quite possible that the percentage of butter fats may be decreased in that milk. Therefore, the best hope must rest on breed, of which there are certain cattle notable for their good dairy characters. In order of merit the leading breeds were Jersey, Holstein, and Ayrshire, both for butter and weight of animal. The latter is the more profitable of the three in producing stock that can be fattened for the butcher, or herself go to him when aged. The bull is the most important in transmitting qualities; therefore should be pure bred and from a butter-yielding herd, and may in time raise the dairy herd up to the standard. But it would be more profitable, if it is possible, to buy pure-bred cows or heifers than to breed up from cows of no particular breed. It is a mistake to suppose that ordinary cows of no special breed, which may even exceed in butter yield the average of pure stock, will reproduce equally good cows. Their excellence is purely accidental, and therefore very unlikely to be transmitted to their offspring, but with pure breeds the quality is permanent, and certain of transmission. The point to be noticed in procuring pure-bred cattle is conformity to a certain type or shape, the chief points being a high pelvic arch and the flank well up, showing the udder plainly. The owner should also be required to supply a table of the milk and butter yield of the progenitors of the stock purchased, as well as a vet.'s certificate of freedom from disease. It is said that a Holstein cow has to produce 7,900lbs. of milk in ten months, or 432 in four days, and make 11lbs. of butter in seven days, before it can be registered in the herd-book. In proof of my contention take the average ratio of milk to butter of the cows of this district, and even of the South-East—*vide* milk factory returns. We find it is 25 to 1—that is, 25lbs. of milk produces 1lb. of butter. Compare that with a test of Jersey cows lately held in England. The ratio of the prize cow was 16·70 to 1, 103 days in milk; average ratio of 29 cows was 17·86 to 1, 129 days in milk; average of 44 cows was 18·93 to 1, 119 days in milk—the whole about 30 per cent. better than ours. Again, the prize cow only yielded 4galls. of milk for the one day, but produced 2¼lbs. of butter. Some of our cows may come up to that yield, but for a week or so only; the average is far below it.

Mr. Hector considered breed preferable to feed, as pure-bred dairy cows could be relied on for milk of good quality. He favored a cross between a Jersey bull and a Durham cow for this district, but it should be of the dairy family of Durhams. Mr. Hannan thought Jersey and Holstein cross the best cows for dairy purposes. Mr. Jose contended that imported pure-bred cattle should receive food as near as possible to that to which they had been accustomed, and that a casual good cow put to a pure-bred bull would have as good influence on her projeny as the bull would. Mr. Wright secured a cow from a Queensland mob which yielded sufficient milk to make 16lbs. of butter per week. She had given birth to six or eight heifer calves from mongrel bulls, and only one of that number was of any value as a dairy cow.

Carrieton, July 27.

Present—Messrs. W. J. Gleeson (Chairman), M. Manning, W. Steinke, F. Vorter, J. B. Harrington, H. Menz, W. H. Byerlee, N. Travers, F. Kaerger, and J. W. Boch (Hon. Sec.).

Cultivation of Soil and Growing Wheat.—Mr. H. Menz read a paper on this subject. The following is the substance of it:—

If feed and time would allow he preferred to plough every year and to fallow early, but during the past three years northern farmers had been compelled to put their seed in as early and as cheaply as possible, as they had to purchase their horse feed. Naturally the land was not worked as it should be, and became infested with weeds. These weeds can be eradicated by early fallowing, before they come to maturity, and then the horses can have a spell whilst there is plenty of feed to get them into good condition. If the fallow is again scarified before harvest the second crop of weeds will be destroyed. Some farmers are satisfied with scarifying every year—just loosening the soil – but this is a mistake, as some of the subsoil requires to be brought to the surface to take the sourness out of it, and the surface so l should be turned under with the straw and other rubbish, which will also enrich the soil. Plough shallow, and have it inclined more to the right than usual, when the mould-board will do better work in burying the rubbish. A strong objection to scarifying the seed in is that the wheat is thrown together on the ridge formed between the tines of the implement, consequently the rain runs from the plants instead of into a drill, as it should do, and unless the plants are deeply rooted. Some of the grain, however, falls into the drills and receives all of the benefit of the rain. In 1898 he tried three experiments of ploughing the seed in, and scarifying, and sowing, and another one of simply scarifying the seed in, all under exactly same conditions of soil, side by side, during dry weather. The ploughed in portion did the best, then that which was first scarified and then sown, and the worst was that which was simply scarified in, where the weeds were most destructive, and seemed to have got a start before the wheat came up, and maintained a lead to the end. He thought farmers should put no more land under crop than they have strength to thoroughly work, and then their returns would be more satisfactory.

Wire Rabbit Traps.—Mr. Menz spoke in strongly favorable terms of the wire rabbit traps illustrated and described in *Journal of Agriculture and Industry* of December, 1898, page 409.

Breaking Horses.—Mr. F. Kaerger read the following paper:—

Begin to handle them when two years old, and teach them to lead, then turn them out for a week or so, leaving the bridle on, so as to teach them to eat and drink with the bit in the mouth. After this treatment they will never get a sore mouth and are very easy to guide. It is very handy to have a horse able to eat and drink with the bit in its mouth, for if the owner is out on the run he can just unbuckle one side of the reins and let it go, but if the bit is removed horses generally run away, and if the reins are simply thrown on the ground he steps into them with the hinder feet. With draught horses there is no need to take so much trouble, but in all cases break them in with an open bridle. If a horse broken in this way should happen to pull off the blinkers it is not so easily frightened, and this is often the cause of bolting.

Sore Shoulders.—Mr. Kaerger said that for sore shoulders on horses he uses two parts of salad oil, one part of kerosene, and a very little bluestone, to be well shaken before application.

Woolundunga, July 10.

Present—Messrs. H. Aldenhoven (Chairman), S. Gunning, J. H. Michael, T. H. Prosser, G. Lewis, and N. Rogers (Hon. Sec.).

"Cultivation."—Mr. H. Aldenhoven read the following paper:—

What is cultivation? Is it scratching up enough soil to cover the seed for a crop of whatever it may be? I think not, for when we cultivate, we do so with certain objects in view, which are—If the ground is hard, stiff, or baked, we loosen it up to expose it to the action of the air, and also to allow any moisture that may fall upon it to soak down into it. If it is too open, we cultivate it in order to settle the surface and make it firm. If it is weedy or dirty, we cultivate it to kill the weeds growing upon it. All very important objects, but there is another very important point we cultivate for, that is, to prepare a fine loose bottom for the roots to travel in search for plant food, for it is not enough to have all the necessary plant food in the soil, but the soil must be in a state that the roots may be enabled to travel through it in all directions in order to absorb such food, which they cannot do if the soil is too stiff and soddened, which is often the case where there is no under-drainage. The soil in this district, with the exception of a few flooded patches, is very porous, and all that is required is a good clean seedbed, which, in this dry north, cannot be too fine and firm; for it is unlike the land below Goyder's line of rainfall, where in many places, if you work the ground too fine it settles down after a very heavy rain like a brick. With a loose porous subsoil like we have in parts of our Upper North, we cannot have the ground too fine and firm at the surface, but you must not confound fine and firm with stiff and baked. I have seen crops which were not very rank at all fed down short until late in winter by sheep in the Murray Flats, and the adjoining farmers considered it madness, but when it came to harvesting they were all surprised to see the crops that were fed off yield two bushels more per acre than the best crops in the neighborhood that had not been fed off. This proved beyond doubt that the soil was too open to keep in the moisture, and that the sheep running over it settled the surface soil without interfering with the soil at the roots. You should not run stock on ground which is in a puddle after a very heavy rain, especially cattle and horses, which I would not allow to run on any crop, neither wet nor dry, as they are far too heavy, and tramp the soil too deep. I will now say a few words about irrigated soil. Always bear in mind that whenever you swamp any ground you must work the same, not when it is in a puddle, but as soon as it is dry enough to work freely. When the soil is loose and lies close together at the surface it does not suffer nearly so much as ground that is solid and stiff from quick and sudden changes of temperature. When I started gardening in the district I planted several thousands cabbages, besides a lot of other vegetables. Finding that my supply of water was not enough to keep them all going, I decided to let a lot of cabbages go without water. I hoed the soil up and broke it up finely with a concrete hook and did not water it any more. The rest of the cabbages I watered three times a week. To my surprise I found, a month later, that the cabbages which I had cultivated without any water had made twice as much growth as those that had been watered all the time, and that I had actually wasted many thousand gallons of water, besides time and labor. The depth you will have to cultivate will greatly depend on the nature of your subsoil. If it is stiff underneath you will have to cultivate the subsoil as deep as you can. I do not mean to bring the raw subsoil to the surface, but merely loosen it up underneath. Care has to be exercised not to bring any subsoil to the surface when you are seeding. If you bring up any subsoil at all you should always do it when fallowing, so as to have it exposed to the action of the air during the summer. The greater part of our district does not want extra deep cultivation, as it is loose enough underneath for the roots to go down to a very considerable depth.

Mr. Aldenhoven then mentioned finding roots of barley grass 3ft. 6in. deep, wheat roots broken off at over 2ft. deep, &c. Roots of wheat matted together like a gunny bag or "hard pan" at 7in. deep in Mount Barker district—result, heavy straw but shrivelled grain, and then continued—

Now had this ground been subsoiled what a difference would there have been in the return. As we have none of that kind of soil up here let all of us think of how we may improve our system of cultivation, for it behoves us better to try and do justice to our holdings and to ourselves by giving our own country a show than to sit down and grumble discontented about it and the climate, or perhaps go to some other country where the geese go just as barefooted as they do here, or find out, like some who have left their comfortable homes here before now, that they will have no geese at all to walk about in their new homes.

Members agreed that proper cultivation will tend very greatly for lack of rain. When the soil is properly worked trees and culinary vegetables will thrive with considerably less water, and wheat crops benefit largely from harrowing, particularly after rain.

Burra, July 28.

Present—Messrs. F. A. S. Field (Chairman), Hon. J. Lewis, Joseph Flower, W. Heinrich, E. Goodridge, F. Duldig, W. G. Hawkes, T. Sandland, J. Scott, J. Rogers, and R. M. Harvey (Hon. Sec.).

Grubs.—The Chairman showed a large number of grubs from a crop of forty-five acres of wheat belonging to Mr. P. S. Killicoat, at Kooringa. They were supposed to have been the cause of the complete destruction of about twenty acres. Another sowing had been made on the bare patches about ten days back, and these were also being rapidly eaten. The land had not been cropped for over two years, and was a good grass paddock. The seed had been pickled with bluestone, and was sown broadcast. [Grubs sent down look like those of the "click-beetle," or "jumping-jacks." Crows, magpies, plovers, and many other birds would keep them in check if allowed to live on the land. So far as known there is no other way of dealing with grubs.—Gen. Sec.]

"How Farmers Should Prepare Wool for Market."—Mr. W. G. Hawkes read the following paper:—

The importance of preparing wool so as to meet with the approval and command the attention of the woolbuyers cannot be over-estimated, and that there is room for a very considerable improvement in the "get up" of the ordinary farmer's clip a stroll through any of the wool stores during the wool season will amply demonstrate; and to some extent this applies to large growers as well as to small, but my purpose is to deal with the latter. Some drawbacks must inevitably prevail with the small grower which do not occur in the larger clips, notably the impossibility of making large enough parcels of a given description of wool; and in the case of farmers who deal in sheep rather than breed from a fixed type there is not that reliability of brand which a woolbuyer desires, and in fact which we all desire in anything we buy. Against this, and in the farmers favor, there is, however, the very much better opportunity which the farmer possesses of minute personal control over each fleece of wool from the shears to the wool bale, a work which in larger sheds is relegated to many hands, and not unfrequently results in some amount of slumming.

Shearing.—Commencing with the first process of shearing the sheep, let there be the greatest care taken that the wool is severed free from second cuts. This not only applies to the ordinary body shearing but likewise and particularly to the opening of the neck and belly. In opening the neck wool the shearer should keep both blades of his shears well down on the skin, and the wool should be torn out instead of, as frequently seen, cut through and the staple injured. The belly wool should also be taken off by a clean cut underneath the wool with both blades on the skin down the right hand side of the belly division, then shorn across and torn away from the opposite side. This is commonly known as the side delivery. The fleece should be kept as intact as possible, and should not be trod upon or torn about unnecessarily, it should be lifted by the breech end from the floor and thrown carefully and evenly on the wool table with a good clean spread.

Skirting.—The chief point to be observed in the skirting of the fleece is to avoid overskirting, but at the same time to skirt sufficiently. Not one particle of clean free wool ought to be removed, but all stained, burry, matted, wasty, or gluey portions should be taken off. In most cases the top knot, the shoulder points and a light breech skirting will suffice, but much depends upon the condition of your clip, whether clean or dirty, and precaution taken accordingly. After skirting, the fleece should be carefully folded by lapping one side evenly over a sufficient distance to be covered by the lap of the other side and the wool then rolled from both ends firmly, but not tightly enough to tear.

Pressing.—It is then ready for the press. It should not be tied, but handed carefully to the presser, and placed in rows of three, with nine to the layer, in the press. Each bale should contain a sufficient number of fleeces to make up a total weight of not more than 380lbs. or less than 360lbs. This can easily be arrived at by weighing a few fleeces separately and calculating the number required to the bale. Uneven weight of bales, especially on the heavy side, invariably awakens distrust in the buyer's mind. The bale should be sewn up by a lock-stitch of strong double twine not more than 1in. apart. It should be branded as neatly and evenly as possible with stencil-plate brands, the owner's mark on top, number next, and description underneath, all on the cap end of the bale. A brand put on with the thumb dipped into a tarpot is not conducive to the merits of the article inside. On the subject of packing wool for market I regret the necessity of warning growers against the unsavory and ruinous practice of flushing, or, in other words, placing a better class of wool on top of the bale to that contained underneath. It is fortunately of rare occurrence, and the announcement made by the woolbuyers publicly last season, that they intended to take steps to protect themselves against such gross fraud, will, I trust, have a salutary effect, and prevent the recurrence of what, no doubt, is a criminal act.

Classification of Wool.—Not less in importance to the shearing, skirting, and pressing of the wool is the subject of its proper classification, and it is here, as previously referred to, that the small grower is handicapped. In most cases his clip is too small to divide into two classes of fleeces, and his locks, pieces, and bellies sometimes do not amount to more than one bale in all. If the clip be a ten-bale one the farmer may very properly make two classes of fleece, the bulk being firsts and the second class consisting of, perhaps, a bale or two of the very worst fleeces, heavy in yolk or dirt or matted or seedy, anything differing greatly from the bulk of the clip. It is at all times unwise to attempt too much grading, or cutting up into many lots, unless by a skilled wool classer, and then rare judgment is necessary. Make as few sorts as possible, but always cull out from the bulk any very objectionable fleeces. Even if the clip be only one of three bales, it is better to throw any very bad fleece, if there are any, into the piece rather than mix them with the good fleece.

Pieces and Bellies.—The classification of pieces, bellies, locks, and stained, call for some special remark. Dealing with pieces first, that is the skirtings, if the clip is large enough to admit of it, make one bale or more of the best pieces, calling them first pieces. Care must be taken to take off every bit of stained wool from these first pieces; also any gluey lockey ends. If the clip is sufficiently large, the bellies ought also most certainly to be pressed separately. They must also be carefully looked through, and all stained grizzle pieces taken out. The balance of the wool on hand will then consist of stained wool, locks, and perhaps second pieces, the refuse from the first pieces. If these are not sufficient in quantity to make separate bales of, I consider it advisable for the grower to mix them all together into one bale and mark them as "Pieces." This is preferable to bagging. I would remind growers to always dry their stained pieces thoroughly in the sun before pressing, and also to cut off all dags. You may get 1¼d. per pound for dags, but it will be at the expense of a much greater quantity of 3d. wool at the same price. If the farmers clip is not large enough to make separate bales of first pieces and bellies, the next best thing to do is to raise the standard of the bellies as far as possible, so as to approximate with the quality of the pieces, and press them together. This can be done by taking off the short discolored parts of the belly wool. The rest of the wool in a small clip must of necessity go together. In conclusion, let me point out that the chief aim of every farmer should be to make his brand of wool as attractive and as reliable as possible. The fullest result may not come the first year, but it most certainly will come; and in conjunction with care in breeding, as advised by Mr. Field in his recent paper, there is no reason why the farmer's small clip of wool should not fetch prices approximating closely to those of the larger and better known brands.

Renmark, July 20.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, W. Moffat, F. S. Wyllie, E. Hutton, R. Kelly, H. Swiney, and E. Taylor (Hon. Sec.).

PRUNING THE APRICOT.—Mr. Hutton read a short paper in continuation of his remarks at previous meeting on pruning the Moorpark apricot. They would have to find out and adopt the most suitable methods of correcting past errors in pruning, suiting their application to the condition of their trees. Such evils as unhealthy and rampant growth, dead wood, sunburn, &c., could not always be charged against unsuitable soil conditions. They were most often the direct cause of injudicious pruning. In producing fruit by means of irrigation in dry districts, a system of pruning, economical from every point of view, is desirable. Each tree requires individual consideration. Overcrowding of main shoots will soon result in absence of fruit wood low down, rubbing of limbs, and difficulty in reaching the inner growth. Thin out freely, and hollow the centre where main shoots are well set up round the tree, but if they incline to a horizontal position it will be most unwise to cut away the growth and expose them to the vertical rays of the sun. For purposes of close cultivation side shoots must be removed. A long discussion ensued. Some members favored low bushy trees, which others contended interfered with the economical cultivation of the orchard. They contended that the trees must be so trained that the scarifier or cultivator could be worked right up to the butt of the trees, and so avoid altogether the necessity for hand hoeing, except with young trees. Some of the growers were against summer pruning or shortening in, while others favored the practice for the first three seasons, after which the ordinary winter pruning should suffice. The discussion lasted nearly two hours, and it was finally agreed by the majority that where irrigation was practiced the trees should be trained in the form of the letter Y, having a flat top, and starting with a butt 12in. to 15in. high.

Appila-Yarrowie, July 21.

Present—Messrs. J. Wilsden (Chairman), P. Lawson, J. C. W. Keller, A. Fox, C. W. H. Hirsch, J. M. Grant, N. Hannagan, J. H. Bottrall, W. C. Francis, J. O'Connell, J. Daly, J. H. Klemm, E. Catford, and C. G. Bauer (Hon Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year the average attendance of members was ten. Three papers had been read, and a number of important subjects discussed. He regretted that visitors to their meetings were rare. Members should try to induce their fellow producers to attend the Bureau meetings, as, with more interest taken in their work by the producers generally, the better the results. The officers were thanked for their services and re-elected, INFLUENCE OF PREVIOUS SIRES.—Some discussion took place on the influence of previous sires on breeding stock, many of the members being of opinion that it was injurious to pure-bred stock to allow them to mate with sires of other breeds. The Hon. Secretary proposed to bring the matter before Congress. [This is an abstract question upon which there is great difference of opinion. Many eminent breeders strongly support the principle of telegony, and bring conclusive evidence to prove their contentions. Equally eminent breeders are just as strongly opposed to the idea that there is anything in it, and bring equally conclusive evidence to show that the evidence of the other side is unreliable.—GEN. SEC.]

EXCURSION FARES.—This Branch is in favor of the suggestion of Stockport Branch that special excursion trains should be run for the benefit of farmers. The ordinary excursions are run at times when very few farmers can avail themselves of the opportunity, owing to press of harvest and other work. Members considered that the revenue would benefit if excursion fares were given during February and August or September.

IMPROVEMENT OF BUREAU MEETINGS.—The Chairman read from July *Journal of Agriculture* paper by Mr. R. Higgins, of Minlaton Branch, on "How to Improve our Bureau Meetings," and a good discussion followed.

EXHIBIT.—Mr. O'Connell tabled well grown specimens of turnips, and Mr. Catford some oranges, which were considered to be superior to those grown in the Wirrabara Forest.

Mount Bryan East, July 22.

Present—Messrs. W. Bryce (Chairman), T. Wilks, H. Wilkins, J. Honan, W. Quinn, R. Webber. W. Dare (Hon. Sec.), and one visitor.

TAGOSASTE.—In most cases the seed of the true tagosaste (Cytisus palmensis) has failed to grow, but Mr. Webber got one plant from four seeds. [Several members have had plants come up after all hope had been abandoned.—GEN. SEC.]

HEADLANDS, &c,—In answer to questions, some members learned that about 4½ft. is the usual distance of ploughing from a fence.

EXHIBITS.—Mr. Wilkins showed a pig-scraper made of a triangular piece of steel, with handle and hook at the end; also white Kaffir corn and skinless barley in blossom and 30in. high Mr. Bryce tabled some very fine parsnips.

DRAUGHT STALLION WANTED.—Members desire to see a good draught stallion travelling this locality. In answer to a question, the best time to castrate colts is when they are a year old. [Other authorities say not later than two years.—GEN. SEC.]

Gawler River, July 21.

Present—Messrs. J. Badman (in chair), R. Badcock, J. Barrett, J. Hillier, A. Bray, T. P. Parker, F. Roediger, D. Humphries, H. Roediger (Hon. Sec.), and one visitor.

FORAGE CROPS.—Mr. J. Badman initiated a discussion on the best forage crops for the district. He pointed out that this depended much upon soil and local conditions. North of the Gawler river there were numerous sand ridges which some people made to produce various kinds of fodder, fruit, &c., but most of them were not utilised. With water and manure this soil would, doubtless, be largely utilised in the near future. Between these ridges, and on both sides of the river, the land was well adapted to the growth of wheat, hay, and other crops, while the flats will produce almost anything, especially with irrigation. He considered wheat the best all round crop for the locality, preferring the White Tuscan variety. If cut for hay it has a ready sale, while it produces a good grain and yields fairly well. Early Para was valuable on land infested with wild oats, as they come in about the same time. Bearded wheats were not looked upon with favor by millers or chaff merchants, but make good nutritious feed. He preferred to cut wheat for hay when the grain was fairly well formed. Oats for hay were also grown. The Cape, Champion, and Scotch Grey varieties were most favored. Oaten hay was not, as a rule, well liked by chaff merchants, but he believed this was due to the crop being cut too early. They are best when left till nearly ripe, but the color is then much off. For early green feed Cape barley, rye, and vetches were suitable, the former being best. Rye is sweet if cut young, but soon gets stringy. With irrigation lucern was one of the best of green fodders. In favorable seasons maize, sorghum, pie melons, can be profitably grown, but too much depends on the weather. Mr. Badcock said it was difficult to get oats at the stage the chaff merchants wanted it. Several members recommended sowing a mixture of wheat and oats for hay. Mr. Clark (visitor) found Leak's Short Sandy oats one of the best for hay. Members generally preferred barley to rye for early green feed, and agree that with heavy irrigation and manure lucern was the best green fodder to grow. The Hon. Secretary said it was best cut just before it was in full bloom. Jersey Tree kale grew well with him, and proved a good stand-by when other green feed was short. Amber cane was considered to be the best of the sorghums, but not so nutritious as maize.

Dowlingville, July 21.

Present—Messrs. R. A. Montgomery (Chairman), J. Illman, T. Lombladt, J. Phelps, T. Kenny, S. Lee, W. T. Holland, J. Birkin, R. Foggo, G. Mason, G. Inkster, J. L. Broadbent, F. W. Roberts (Hon. Sec.). and two visitors.

Farmers' Holiday.—Members agree with Stockport Branch *re* excursion fares on all lines for farmers some time during February and September.

Seed Wheat.—Mr. Illman said he bought seed wheat from four different farmers this season, and drilled them in at the same with his own seed, all pickled and treated exactly alike. Some of the purchased grain did not germinate, and the rest is coming up very weak and spindled, whilst his own seed is growing well. He thought the purchased grain was injured in the stripping. His own stripping machine has beaters only 14in., whilst most others have beaters of 18in., which gives too much sweep and does not add to the thrashing power. Mr. Phelps thinks the great mistake lies in leaving the seed crop to become too ripe and flinty. He had looked under the screen of his winnower and saw quantities of germs of wheat that had been knocked out by the stripper.

Port Germein, July 29.

Present—Messrs. G. Stone (Chairman), P. Hillam, W. Crittenden, W. Head, W. Mortess, C. O'Loughlin, J. R. Gluyas, J. Jarrett, W. Broadbear, and A. W. Thomas (Hon. Sec.).

Farmers' Holiday.—This Branch does not favor alteration of regulations *re* excursion trains in favor of farmers.

Annual Report.—Eight meetings had been held during the year, with an attendance of nine members. Seeds for experiment had failed owing to the dry spring.

Exhibit.—Mr. Broadbear tabled a splendid sample of oranges grown by himself. One cluster of nine weighed 5¼lbs. The tree had several other clusters. The trees had been irrigated with water from the Baroota weir. He had also grown good vegetables with the aid of water from the same source.

Bovine Ophthalmia.—Mr. O'Loughlin had cured his cattle suffering from ophthalmia by bathing the eyes three times daily with a mixture of 4ozs. tincture of opium in 1qt. of water.

Morgan, July 22.

Present—Messrs. R. Windebank (Chairman), E. Jacobs, T. Schell, J. Bruhn, H. Hahn, G. Roediger. A. Stubing, and J. Wishart (Hon. Sec.).

Officers.—Officers were thanked. Mr. R. Windebank was elected Chairman, and Mr. J. Wishart Hon. Secretary.

Pests and Crops.—Caterpillars have done considerable damage to crops; also rabbits, which are increasing rapidly. The long-continued dry weather, accompanied by severe droughts, has also had a bad effect upon the crops.

Morphett Vale, August 3.

Present—Messrs. L. F. Christie (Chairman), J. R. Bain, H. Anderson, F. Hutchinson, J. McLeod, J. Spriggs, W. Holly, T. Anderson and A. Ross Reid (Hon. Sec.).

Summer Crops.—Mr. J. Spriggs said the best time to sow field peas in this district is in July, but if drilled in with manure early in August they might do well. Mr. F. Hutchinson advocated the growing of swede turnips (rutabagas) for milking cows, and said they do not impart a taste to the milk. Members generally agreed that mangolds do well in this locality, make excellent food for sheep and cattle, and ought to be far more commonly grown. Pumpkins are not considered profitable for fattening pigs, although they might be kept in condition on them. Mr. Hutchinson said pumpkins keep well if buried in sand. Mr. Anderson said he had kept grapes for several months in the same way.

Fallowing.—*Re* best depth to fallow limestone soils Mr. J. McLeod deprecated turning up the limestone rubble, but if no subsoil were moved 5in. to 6in. is a good depth. All members agreed that land is seriously injured for cropping by having the limestone removed. Mr. Bain said it is not advisable to work fallows on sandy land, but to let it lie in the sod; and Mr. Spriggs thought this would apply equally to ordinary red land. The Hon. Secretary did not agree with Mr. Spriggs. Other members generally were in favor of thoroughly working all land during summer.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Amendment of the Labor Law in New York State.

By two Acts of the Legislature of the State of New York passed on April 1 (and coming into force—the one on September 1, 1899, and the other immediately) certain amendments are made in the "Labor Law" of 1897. The first of these new Acts relates to the manufacture of clothing, &c., and cigars in tenements, and as regards clothing, extends the provisions of the 1897 law to the alteration, repair, &c., of such articles. By the previous law the manufacture of the enumerated articles in the tenement houses was prohibited "except by the immediate members of the family living therein." This prohibition is now removed, but in all cases (including family work) a licence must be obtained which will specify the maximum number of persons who may be employed, allowing not less than 250 cub. ft. of air space per worker per day, or 400 cub. ft. by night. Shirts, &c., are no longer to be among the enumerated articles if "subjected to the laundrying process before being offered for sale." The amending Act gives power to the factory inspector in the case of any of the enumerated articles being imported into the State having been manufactured "under unclean, unsanitary, or unhealthy conditions," to label the same as "tenement made," and report the case to the local board of health, which is to make such order as public safety requires. The second of the amending Acts relates to the duties of the factory inspectors and the enforcement of the provisions of the law. The inspection of scaffolding, &c., is now entrusted to the factory inspector (instead of the police authorities). If hoisting apparatus is used (for lifting material) within a building being constructed, the openings in each floor are to be enclosed by barriers; and in constructing a building of over four stories timber is not to be hoisted on the outside. The number of deputy inspectors is increased from thirty-six to fifty. Under the law of 1897 it was provided that a female under 21 years of age should not be employed before 6 a.m., or after 9 p.m., or for more than ten hours in any one day, or sixty in one week, except to make a shorter day on the last day of the week, or more hours in a week than would make an average of ten hours per day for the days so worked. This restriction is now extended to females of whatever age. It is made illegal to allow a child under 16 to operate any dangerous machines. The new Act provides for the periodical (six-monthly) inspection of boilers other than those already regularly inspected under local laws.—*Labor Gazette* England for June.

Gumeracha Butter and Cheese Factory.

The Industrial Editor on a recent holiday took advantage of inspecting the Gumeracha butter and cheese factory, formerly a steam flour mill, which is situate at the mouth of a gully about half a mile to the east of the township of Gumeracha. The appliances of the factory, both for butter and cheese making, are quite up to date, and the manager, Mr. A. Noble, has had a most successful career as a dairy expert in England, Victoria, and Mount Gambier before he took charge of the Gumeracha establishment. The motive power is derived from a six-horsepower steam engine ; a never-failing water supply is pumped from the spring close to the factory, and the water is carried in pipes to every room in the building where it is required ; pipes for steam are also laid on to all the rooms, so that cold or hot water or steam is available whenever required. At the present time the factory purchase weekly 3,000galls. of milk, which produces 1,500lbs. of butter per week. Cheese-making has not yet commenced for this season, but when the work is commenced it will be kept going for about six months, and from 4 tons to 5 tons of cheese per month. The milk supply will increase from the present time until the middle of November, when the factory will take in about 2,000galls. per day. During the summer months milk is received every day, but in winter every other day. The cheese-making plant consists of two vats each containing 502galls., four screw cheese presses capable of pressing forty cheeses at once, two large curd coolers and salters. The butter plant includes two DeLaval separators; two large churns, which are capable of churning 250lbs. of butter each; one butter printer, which turns out and cuts out 9lbs. of butter in one operation. The skim milk and buttermilk is drained off into a large tank and sold to the dairymen at ½d. per gallon; the surplus is utilised for feeding pigs belonging to the factory, there being always a good sale for the animals thus fed. As the milk is received a sample of every dairyman's supply is taken and tested by the Babcock tester, and payment made according to results. About sixty farmers supply the milk They keep from ten to fifty cows each, which gives employment to about seventy or eighty persons. No particular breed of cattle is kept, but some farmers are giving attention to Jerseys, which, in the opinion of the dairy manager, are undoubtedly the best dairy cattle. The factory employs five men in summer and three men in winter. The butter is disposed of in Adelaide, and some is exported, and top prices are always secured for the produce. The Adelaide market takes all the cheese manufactured. A refrigerating plant completes the equipment of a first-class butter and cheese factory. Visitors to Gumeracha should not miss inspecting this compact and interesting manufactory, where cleanliness and civility will be shown to all comers. C. C. C.

Woman's Work and Wages.

BY AGNES A. MILNE.

In continuing the remarks on "Woman's Work and Wages" it was stated that no perfect solution of the dire problem was in view but by legal enactments and combinations of the workers.

It was in the year 1890 that the evils of "sweating" first came under the writer's notice, and at that time the hideous suffering, overwork, and want brought home to many of the well-to-do in South Australia the question "How do the poor live?"

Numbers of people took up the cry—some from pity, others from excitement, and many from a pure desire to benefit those in the "social" scale who had fallen even below the hope of things ever being better, and for many months the enthusiasm ran high, and for a time the terrible evils of "sweating" were checked; but after a time new topics absorbed the minds and interests of the people, and "sweating" and the sweating evils were lost to public view. But still all the horrors were there, breeding their baneful influences, and to-day the evil is more rampant than ever.

The definition of "sweating," as given by the House of Lords Committee, London, in 1889, was—First, unduly low rate of wages; second, excessive hours of labor; third, insanitary state of work places; and Mr. Schloss has added this important point—taxing of working powers to an unreasonable extent, or getting sixpennyworth of work out of fourpennyworth of pay (driving), as is done in Adelaide to-day, especially in the shirt-making and white-work industries; and the primary cause of this evil growing so rapidly is the home-work system and the absence of combination among the home workers and small masters; also the competition of alien and colored races with South Australian manufacturers.

The smaller the workshops the less use is made of machinery, the less is labor sub-divided, and the greater are the evils of "sweating"; therefore all aliens should be compelled to conform to the local factory laws and regulations, and not be allowed to have women and girls working for them in questionable places and under insanitary conditions. These places are practically free from all regulations, being small workshops, usually hidden away in dwelling-houses, which easily escape the observation of the factory inspectors. All work places employing one or more operatives should come under the factory system, for under this system the operative owns nothing but his labor; he forms one of a large band who work collectively in buildings which they are not called upon to provide under a directing manager, who is legally responsible for the conditions of their employment, the produce being owned, sold, and distributed by others than themselves.

The "sweating" den of the little middleman, where the raw material of the real employer is worked up, is an intermediate state between home work and the factory system, combining the worst features of both with the advantages of neither.

Hence the lowering of prices paid for work done, especially to shirtmakers, for where our wholesale warehouses will pay 4s., 5s., or 6s. per dozen for goods to me made up, these middlemen get them made up for 2s. 6d., 3s., and 4s. the dozen, thus reaping the wholesale and retail profits.

The same thing obtains with whiteworkers. Ladies' underlinen is made up at ridiculously low prices, and the alien hawkers sell the same lines at fabulously high prices, gaining as much as 100 per cent. on the transaction alone.

The removal of the alien from all the "sweated" industries would be a partial relief, but would not remedy the evils. The real remedy lies in a quickening of an industrial evolution; and in a future paper will be given some of the remedies from this great evil under which so many female workers groan to-day.

The wages of these workers range from 2s. 6d. per week to 12s. If they receive 14s. per week that is reckoned exceptionally good. But to return to the question, "How do the poor live?" One poor woman told the writer of this article the other day that by working twelve to fourteen hours a day she may make £1 5s. per week; out of this she had to pay for rent, fire, light, food, and clothing. This is what is called a good case. But it is the same old, old story—

Work, work, work!
My labor never flags.
And what are its wages? A bed of straw,
A crust of bread—and rags.

HOOD.

The Skilled Labor Market in January.

The following memorandum has been prepared by the Labor Department of the Board of Trade for the *Board of Trade Journal*, and also (with additions) for the *Labor Gazette*. It is based on 2,318 returns, viz.:—1,618 from employers, 542 from trade unions, and 158 from other sources:—

On the whole the state of employment has undergone little change, and remains good in all the principal trades. The very slight falling off in one or two industries, such as printing, is attributable to seasonable causes, while there has been a marked improvement in employment in the boot and shoe trade. Few trade disputes of any importance have begun during the month.

In the 121 trade unions making returns, with an aggregate membership of 486,094, 14,627 (or 3·0 per cent.) were reported as unemployed at the end of January, compared with 2·9 per cent. a month before, and 5·0 per cent. in the 116 unions, with a membership of 461,544, from which returns were received for January, 1898, when employment was still affected by the engineering dispute.

Coal Mining.—Employment in January was, on the whole, better than a year ago. Returns relating to pits employing 446,489 work people show that these pits worked on an average 5·16 days per week in the four weeks ended January 21, as compared with an average of 5·06 days a year ago. These averages are considerably diminished by Christmas and New Year holidays.

Iron Mining.—Employment in this industry continues good. At 136 iron mines and open works at which 17,416 work people were employed, an average of 5·19 days per week was worked during the four weeks ended January 21, as compared with 5·59 days a year ago.

In the pig iron industry the improvement in employment continues. Returns relating to the works of 112 ironmasters show that 369 furnaces were in blast at the end of January, or five more than at the end of December. and fifteen more than a year ago. The estimated number employed was 23.903, or 278 more than at the end of December, and 547 more than at the end of January, 1898.

Iron and Steel Manufacture.—Employment has further improved and continues noticeably better than a year ago. At the 205 works from which returns were received, 79,637 work people were employed in the last week of January, as compared with 78,496 in the week ended December 24, and 76,282 a year ago. The average number of shifts worked was 5·60 in the last week of January, 5·59 in the week ended December 24, and 5·54 a year ago.

Tinplate Trade.—Employment fell off somewhat during the month. At the end of January 319 mills were working and giving employment to 16,148 work people, as compared with 335 mills employing 17,333 work people at the end of December, and 355 mills employing 18,061 work people a year ago.

Employment in the engineering and metal trades still remains good. The percentage of unemployed union members in this group of trades at the end of January was 2·6, compared with 3·0 in December, and 6·4 per cent. in January, 1898. (Employment affected by the engineering dispute.)

In the shipbuilding trades employment has also remained good, the percentage of unemployed union members at the end of January being 3·7, the same as in December. The percentage for January, 1898, was 10·9. (Employment affected by the engineering dispute).

Employment in the building trades (painters and decorators and plumbers excepted) has continued good. The percentage of unemployed union members at the end of January was 1·7, compared with 1·8 in December and 2·0 per cent. in Jauuary, 1898.

The furnishing trades are scarcely so brisk. The percentage of unemployed union members at the end of January was 4·3, compared with 3·8 in December and 5·1 in January of last year.

Employment in the printing and bookbinding trades has continued to fall off owing to seasonable causes. The percentage of unemployed union members at the end of January was 4·4, compared with 3·9 in December and 4·9 in January, 1898.

Employment in all branches of the paper trade has improved. The percentage of unemployed union members at the end of January was 3·2, compared with 5·9 in December and 3·0 per cent. in January of last year.

In the glass trades the percentage of unemployed was 13·6, compared with 11·5 in January, 1898.

Employment in the leather trades remains steady, the percentage of unemployed union members at the end of January being the same as in December—viz., 4·5, compared with 4·2 in January of last year.

Employment in the boot and shoe trade has much improved, and is now good at nearly every important centre.

Employment in the bespoke branch of the tailoring trade continues dull; in the ready-made branch it has improved in the factories, but is still slack in the workshops.

Employment in both the spinning and weaving branches of the cotton trade continues good generally.

Employment in the worsted and woollen trades remains quiet. In the hosiery trade employment has improved and is fair.

As regards the employment of women in the textile trades, information respecting 491 mills, employing 82,000 women and girls, shows that 84 per cent. were in mills giving full employment during the month, compared with 85 per cent. during the previous month and 67 per cent. in January, 1898.

Trade Disputes —Twenty-six fresh disputes occurred in January, 1899, involving 2,188 work people. The corresponding number of disputes for December was twenty-nine, involving 6,319 work people; and for January, 1898, twenty-eight disputes, involving 6,795 work people. Eight disputes took place in the building trades, eight in the metal, engineering, and shipbuilding trades, five in the textile trades, and five in other industries. Of the twenty-six new and old disputes, involving 4,171 work people, of which the settlement is reported, six, involving 913 persons, were settled wholly in favor of the work people; eleven, involving 412 persons, wholly in favor of the employers; and nine, involving 2,846 persons, resulted in a compromise.

Changes in Rates of Wages.—Changes in the rates of wages of about 168,300 work people were reported during January, of which number 47,500 received advances averaging 10¾d. per head, and 120,800 (including 120,000 Welsh miners) sustained decreases averaging 2½d. per head. The net result was an increase estimated at about 1¼d. per head in the weekly wages of those affected. The increases were mainly in the iron and steel manufacture group (32,154) and the engineering and shipbuilding trades (9,549). Changes affecting 200 work people were preceded by disputes, causing stoppage of work. Changes affecting about 151,750 work people were arranged under sliding scales, and the remaining changes, affecting about 16,350 persons, were arranged by direct negotiation between employers and work people, or conceded voluntarily by the employers.—*Times.*

Journal of Agriculture

AND

Industry.

No. 2. REGISTERED AS] SEPTEMBER, 1899. [A NEWSPAPER. VOL. III.

NOTES AND COMMENTS.

August has been a very disappointing month to the producers. The first week was showery and nice rains fell over the Northern Areas, freshening up both crops and feed. During the past three weeks, however, the weather has been very dry, and at times unseasonably hot and sultry. On several occasions promises of rain have raised the hopes of the tillers of the soil, only to lead to disappointment. Though the wheat plant generally is holding out well, the crops are very thin in many localities, while the feed has been seriously injured. We can only hope that September will give us good soaking rains throughout the colony, as unless these come soon the harvest will be very poor, except in the more favored localities.

The eleventh annual Congress of the Agricultural Bureau will be holden on the 13th, 14th, and 15th September, 1899, in the Trades Hall, Grote Street, Adelaide. It is desirable that every member of each Branch shall be present, and not delegates only ; but at any rate each Branch should be represented by some of its members. A departure from the usual custom is to be initiated on the evening of Friday, September 15th, when each member attending is invited to bring not more than one lady or gentleman friend to enjoy a social evening, and listen to the highly interesting and popular lecturer, the Hon. J. L. Parsons, on "Japan," illustrated with limelight views. Light refreshments will be provided. The gramaphone will be set in motion by Mr. Reeves, of Reeves and Co., a few songs will be contributed by friends, and the floor will be cleared for a dance at 10·30 p.m.

The whole of Australasia regrets to hear of the death of Mr. David Wilson, the Victorian Dairy Instructor, on Saturday, August 26th, 1899, from cancer in the abdomen. Mr. Wilson was the most active organiser of co-operative effort that has ever worked in these colonies, and to him is due the enormous development of the export produce industry of Victoria particularly, and in Australasia generally, because other colonies were stimulated into greater activity through the success achieved in Victoria. Mr. Wilson was himself a thoroughly practical dairyman, and brought up a fairly large family to be as practical as himself. He was one of the first to introduce the latest modern scientific appliances for dairy purposes, and was "instant, in season and out of season," in advising all others to follow his example. He was a "white man" in every colonial sense of the word, and we all mourn the loss of a true friend and a public benefactor.

The Department of Agriculture is offering prizes of £15, £10, and £5 for exhibits of export butter. Exhibits are to consist of five boxes, unbranded, which are to be stored at the Port Adelaide depôt for six or eight weeks before being judged. The idea is to keep the butter at the same temperature as on board the mail boats, and for the same length of time as elapses between it being received at the depôt and sold in London in the ordinary course of trade. The various exhibits will be judged by points, and the factories interested furnished with statement of defects (if any) which may show in their exhibits at the time of judging. The competition should be of considerable educational value, and it is to be hoped that a large number of our butter factories will compete.

The *Journal of the Board of Agriculture*, England, publishes reports of analyses of samples of imported butter taken at ports of entry by the Customs authorities during the past four years. In 1895-6, 1,066 samples were analysed, and 125 found adulterated. Of these, 67 came from Holland, 43 from Germany, 8 from Denmark, 5 from Russia, and 2 from Norway and Sweden. The following year only 46 samples were found to be adulterated, of which Holland and Germany were responsible for 11 and 32 respectively. In 1897-8, 25 samples were shown to be adulterated, Germany again being the principal offender with 20 samples. In 1898-9 only two samples out of 1,083 were adulterated, both coming from Holland. The beneficial effect of the action of the Board of Agriculture is shown in the rapid decrease in the number of cases of adulteration detected by its officers. In no case was Australasian or American butter found to be impure.

In 1898 the United States exported pig products to the value of £23,000,000. Some idea of the immense importance of the pig-breeding industry to the United States may be gathered from the fact that the value, in one year, of the exports of pig products exceeds by nearly two millions of pounds sterling the value of the total exports from South Australia during the past three years. The total value of the exports of agricultural products from the United States last year amounted to £177,851,000, of which breadstuffs account for £70,000,000.

The articles on pruning, by Mr. George Quinn, are continued this month, although, of course, pruning operations should have been completed by this time. It is intended, however, to continue the articles, to deal with the summer treatment of the trees, and to re-publish the series in pamphlet form. Our readers will doubtless be pleased to know that the Government has given effect to the recommendation of the Agricultural Bureau, and given Mr. Quinn the additional title of "Horticultural Instructor." Mr. Quinn has been doing the work pertaining to this position for several years with satisfaction to those with whom he has been brought in contact, and the action of the Government in recognising this fact is therefore fully appreciated.

Sir Samuel Davenport, K.C.M.G., who is practically the pioneer in olive growing in South Australia, reports that this season he has obtained from one tree over 5cwts. of olives. The tree in question is over forty years old. The olive crop generally has been good this season, and a considerable quantity of oil has been made.

Our old friend J. Ednie Brown, once Conservator of Forests for South Australia, but now filling the same position in Westralia, has forwarded his 1899 report on " The Forests of West Australia and their Development," with twenty-four large illustrations and a forest map of the colony. The report consists of sixty-eight pages, 11in. x 8in., and the matter is written in the well-known interesting style of the author. On looking over the illustrations, as well as the printed matter, every South Australian must feel a considerable amount of regret that our colony is not similarly favored in regard to forest growths. Mr. Brown has a hobby—that of planting trees and conserving forests—and he ought to be as happy as the days are long in having such magnificent forests to conserve, and in large opportunities for adding to their area and importance as a national asset.

The cold dry weather since the June rains has had a marked effect upon the supply of vegetables in the Adelaide market, especially cabbages and cauliflowers. The consequence was that the price for these necessaries rose to a relatively high price, and, as prices in Victoria were very much lower, considerable importations have been made. Since the middle of July nearly 2,000 dozen of cabbages and 500 dozen of cauliflowers have been received by rail from Victoria.

Owing to a clerical error in the notes by the Inspector of Fertilisers on "Purchase of Commercial Fertilisers," page 43 of August issue, the reference to "soluble phosphate" in superphosphates did not make it quite clear what it was intended to warn purchasers against. Some vendors have shown as "soluble phosphate" the total amount of phosphate soluble in water and citrate of ammonia, whereas, properly, only that soluble in water comes under the definition of soluble phosphate. Purchasers should therefore insist, when they order superphosphates, on the percentage of "*water* soluble phosphate" being stated on the order.

When hay is allowed to stand until the stems of the plants have become hard, woody, and nearly or quite ripe, it is considerably indigestible, and fills the stomach without affording one-half the nourishment that would have been derived had it been cut when tender and filled with the rich juices which later on are converted into cellulose and fibre. The best time to cut cereals for hay is directly the seeds begin to form, and long before they are ripe.

An article called "agricultural sulphate of copper" has lately been placed upon the market in England, and the chemical section of the Royal Agricultural Society of England warns farmers not to be deceived by it. Chemical analysis shows that it consists of 99·04 per cent. sulphate of iron, and 9·04 per cent. sulphate of copper. Pure sulphate of copper should contain 98 per cent. crystallised sulphate of copper, worth 28s. per cwt., whilst sulphate of iron is worth only 4s. in England.

There are close on 800 species of scale insects known to, and described by, economic entomologists. Of these, 130 are found in American states, and twenty-three are commonly injurious to cultivated plants; but only two of these are natives of that country, all the others having been introduced from abroad.

DISEASES OF POTATOES.

During the past few years considerable damage has been done to the potato crops by a disease described as "black spot," "early blight," &c. Scab has also been occasionally reported. Probably one of the chief causes of the prevalence of the former disease is the deterioration of the quality of the tubers, due to continuous cropping from same seed. In several localities a so-called change of seed is obtained by growers in the hills districts exchanging seed year after year with growers on the adjoining plains. This is a convenient method of obtaining seed in good condition for the different plantings, but it must be remembered that it is merely propagating from the same strain. What is required is seed from a different district altogether. The practice adopted by the Mount Pleasant Bureau of obtaining seed potatoes from Tasmania might well be followed by members of other Branches. By several uniting, and obtaining a considerable quantity, the expenses will be greatly reduced.

The disease known as "early blight" (Macrosporium solani) first appears in the form of brownish spots, which gradually enlarge and become brittle. The tubers stop growing almost directly the tops are attacked, and, as a rule, are quite useless commercially. The only remedy for this disease is spraying with Bordeaux mixture, of the following strength:—4lbs. bluestone, 5lbs. quicklime, and 50galls. of water. The plants must be sprayed when about 6in. high, and *before* the disease appears. Treatment must be repeated at intervals of two to three weeks. It is useless waiting until the disease has attacked the plants, as the damage results very quickly. Where hot dry weather follows an attack of the disease, the effect on the enfeebled stalks and foliage is very marked.

The other complaint of scab causes scales and cracks on the tubers, spoiling them for market purposes. Treatment before planting, and using only clean seed, will prevent injury. The seeds are soaked either in a weak solution of corrosive sublimate, Bordeaux mixture, or in formalin. With the former, 1oz. of corrosive sublimate is dissolved in 30galls. of water and the seed left in the solution for four hours and allowed to dry before being cut and planted. Bordeaux mixture, of same strength as mentioned above, is said to be just as effectual, and is much better to handle, as the corrosive sublimate, being a violent poison, requires very careful handling. One part of formalin to twenty parts of water has also proved effective in preventing injury by scab, the seed being soaked in the solution for two hours.

In dealing with these diseases it must be remembered that they are carried on from year to year by means of spores, or seeds, matured on the affected plants. Continuous cropping of the same land with potatoes naturally tends to the spread of the diseases. All diseased tops should be burned, together with any tubers unfit for use. To allow them to rot on the manure heap is to afford the spores every opportunity of reproducing themselves under the most favorable circumstances.

BLOAT OR HOVEN.—A correspondent in an American agricultural paper states that he finds that a dose of turpentine is an unfailing cure for bloat or hoven caused by animals eating green succulent food, wheat, &c. He mixes one to five tablespoonfuls of turpentine, with an equal quantity of milk or water, the former being the better. Turpentine must on no account be given alone, as it will burn the animal. Relief is given in a few minutes in the worst cases. [A tablespoonful of carbonate of soda in a pint of water is another proved remedy.—EDITOR.]

GRAFTING FRUIT TREES.

A LESSON FOR BEGINNERS.

By George Quinn, Horticultural Instructor.

Grafting may be described as the operation of inserting a scion—a twig comprising one or more buds—into a stock, which possesses or consists entirely of a root system ready and capable for absorbing moisture and nourishment.

The scion is usually, but not always, inserted into an incision made in the wood. The chief object of grafting is to change an undesirable variety into one that is more valuable for the purpose in view. By means of grafting a return can be obtained in a lesser time than would be possible by planting a young tree. It is superior to a seedling in that a graft reproduces all the characteristics of the parent tree. With the exception of a cutting, it is the only known method by which an exact counterpart of the original plant can be obtained with certainty. It also enables the grower to increase or diminish the robustness of growth by using stocks suitable for either purpose. By grafting scions from them upon older stocks seedlings may be fruited, and thus tested much quicker than otherwise, and by the selection of certain resistant stocks the injuries of various insect pests may be avoided.

There are many methods of grafting, and endless modifications of these, but the cardinal principle to be observed is the same in all. To effect a union of scion and stock the sap-carrying layers of tissue—technically known as the cambium layers, which are located just beneath the bark—must be pressed in close contact, to the exclusion of the air and all other substances.

It is not essential that these layers should meet exactly all the way around the cut surfaces of both scion and stock, but it should be carefully observed that the greater area of cambium on each which can be brought in contact the more certain and rapid will be the complete fusion of the tissues of stock and scion. It is the observance of this general principle which has caused so many methods to be devised for adjusting the scions and stocks, for experience has taught that it is only in these cambium layers that union takes place. The woody fibres do not unite. It is important to note this, as the presence of a dead or inert substance within the heartwood of a tree, even when the wounds of grafting have healed to all outward appearances, is certainly a source of weakness and menace to the stability of the trees. With a knowledge of this the operator should always select that form of graftage which does not leave a large quantity of this inert matter attached to the scion, or wound the stock unnecessarily in making the incision to hold the scion. The scions should consist of growths of the previous year. They must be well ripened and fibrous, not brittle and pithy. To avoid the latter defect the few buds at the top of the shoot should be discarded. The scions must be cut in the winter, or before the buds swell in spring. Only scions from trees known to be good regular croppers should be used. The scions are preserved best if buried in moist—not sodden—sand, in a cool shady place, as it is desirable to retain them in a dormant state.

The stocks may be roots, young plants, or old trees. These are not prepared in any way until the time arrives for manipulating them and inserting the scions. By this it is intended that roots shall not be dug or tops cut off trees until they are to be worked. Root-grafting (as shown in Plate I.) is usually performed while the stock and scion are still dormant in late winter. Grafts made above ground are completed, as a rule, in early spring, just when the sap starts to move in the trees (these are represented by Plates II., III., and IV.). Bark grafts can only be inserted when the sap is sufficiently abundant to permit the bark and wood separating readily, as is required in budding, or bud-grafting. Plate V. illustrates this section.

Grafting, as dealt with in this article, is usually applied to the propagation or renovation of apple, pear, plum, and olive trees. Stone fruits are invariably budded, although the methods described herein may be safely used on them when absolutely necessary. Citrus fruits are also bud-grafted.

Excepting in the case of quince stocks when used for dwarfing pears, it is always advisable to work each sort upon stocks of its own kind, viz., plum on plum, pear on pear, and apple on apple.

To exclude the dry atmosphere and all foreign substances from the point of union or contact of cambium layers, and prevent the drying up of the sap at this section, a coating of some adhesive substance is necessary upon all grafts made above ground. A rude grafting wax or paste can be made of two parts clay, one part cow manure, and a little hair. The former ingredients are pulverised and worked into a plastic condition by the addition of water, the hair being finally incorporated. A thick coating of this will give fair results if only one or two trees are to be grafted, but in commercial work it is now discarded and replaced by waxes, which are less bulky, less liable to crack or be washed off, and more readily manipulated. The waxes are chiefly composed of resin, beeswax, and tallow. The following is an approved compound:—Resin, 3lbs.; beeswax, 2lbs.; tallow, 1½lbs.; turpentine, 4ozs. These ingredients are broken into fine particles, melted together over a fire, the turpentine added afterwards, and are then ready for use; but care must be exercised in applying hot waxes to the tender bark of a bark-grafted stock, such as the olive. For this reason some of the alcoholic waxes are preferable on soft bark. Lefort's liquid grafting wax is given here as in Professor Bailey's book:—Resin, 1lb.; beef tallow, 1oz.; dissolve over fire, and when dissolved remove from fire and add 8ozs. alcohol. Keep in close-stoppered bottles or tins.

When waxes are applied hot a brush is used, but when bandages are applied to small stocks the bandages or cotton wicks are saturated in the hot wax and wrapped on, remaining in its position without a tie. The ball of wick cotton may be put in the hot wax and saturated prior to being used, or the narrow strips of calico can be wound around a stick and thrust into the liquid wax in a similar manner and be unwound as required. The tools used for the work, of course, are variable. Besides a saw, a good broad chisel, and a mallet for large cleft grafts, a strong sharp pruning knife will do for the purposes of cutting scions and making incisions in all small stocks.

Explanations of the Plates.

PLATE I.—Fig. 1 shows the prepared stock and scion, the former consisting of a piece of root about 4in. long and the thickness of a pen handle. Above it stands the scion, a piece of twig about 6in. or 8in. long. These are desirable lengths. The top of the root (stock) and base of the scion are cut off obliquely, showing a section which may be from ¾in. to 1½in. long. About one-third of the length—from *the top* of this section in the stock—a downward slit is made, and a corresponding slit made the same distance from the base of the section on the scion. When the two oblique sections are placed together as depicted in our illustration, the tongue of the stock will slip into the slit of scion, and *vice versâ*. This is called a *whip and tongue graft*. A very firm mutual grip is thus obtained. This method is usually adopted when rootstock and scion are approximately of the same size, although this is not necessary if the sap layers on stock and scion meet for a fair distance along one side.

The junction is then bound around, as shown in Fig. 2, with candlewick or calico strips, or other material that will rot away pretty quickly, no waxing being necessary, as the grafts will be deeply buried in the soil.

Fig. 3 represents another method of root-grafting, the stock and scion being ready for adjustment. This method is used when there is a greater difference between the sizes of the root stock and scion. It is a very economical process, using up many small roots; in fact, pieces of roots no larger than our illustration can be utilised.

The top of the root is cut wedge shape, and a shallow upward sloping incision made in the side of the scion, just above the base; into this the root-wedge is thrust, as shown in Fig. 4, care being taken to fit the sap layers on one side at least of the stock and scion.

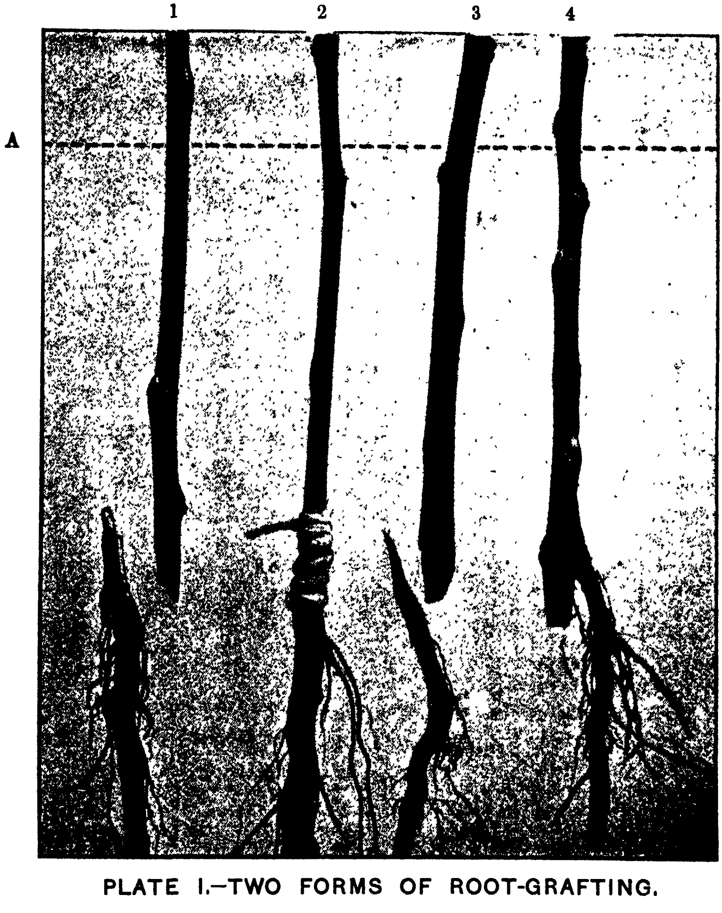

PLATE I.—TWO FORMS OF ROOT-GRAFTING.

The budding is done as in the other case. This latter method permits kinds inclined to root from the base of the scion to do so freely. The much-prized Northern Spy apple roots strongly in this way. The grafted plants are inserted in the soil to the depth shown by dotted line A in our illustration. This only leaves one bud above ground.

In actual practice the roots should be dug up, washed, and carried into a shed where there is a bench to work upon. They are then cut into suitable lengths, trimmed, and sorted into sizes. A sharp seccateur or keen-edged pruning knife should be used. Every precaution must be taken to keep the roots moist—wrapping in a wet bag being a simple method.

Having the roots and scions prepared on the bench the operator joins them by the method explained, and ties the joined sections.

The grafted stocks may be either planted out at once or kept for a while in damp loose sandy earth. If planted in nursery fashion the rows should be 2ft. apart, and the plants from 9in. to 12in. distant in the rows. The solitary bud left above ground is alone permitted to grow to form the future tree.

This is the method pursued to obtain blight-proof apple trees. The root and scion *both* are from a blight-proof kind—preferably Northern Spy—and after the resulting shoot has attained a sufficient thickness a bud of the variety desired is inserted, not nearer than 6in. to the surface of the soil. This height for budding is advocated to prevent adventitious roots being sent out by the budded variety, which is most likely not blight-proof. With the exception of the propagation of apple trees, root-grafting is not used to any extent in South Australia.

Plate II. represents a graft used upon small stocks. It is a whip and tongue method, made as described formerly, and adjusted so that the cambium layers meet only upon one edge, the remainder of the stock being sloped off to assist in making a less ugly joint when healing. This is shown in Figs. 1 and 2. Fig. 3 shows the joint closely wrapped in waxed cotton wick to exclude dry air, &c. This graft is applicable to young shoots on old trees after being cut back a season, or upon young nursery stock, say up to two years' growth. It is made at any required height above ground, and effects a good union.

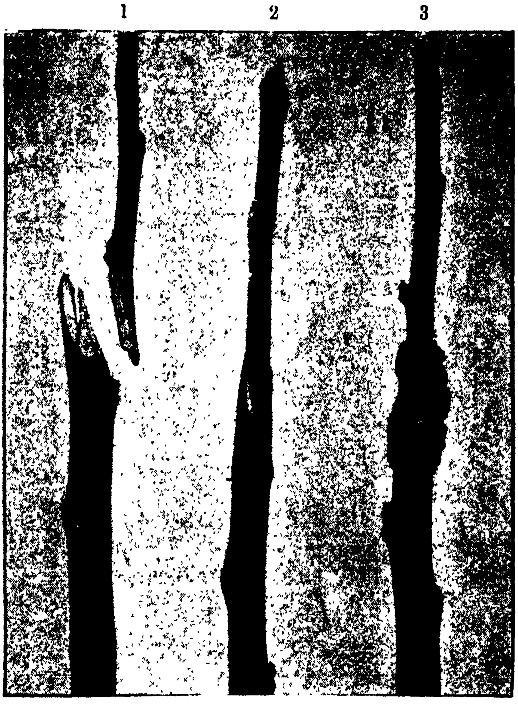

PLATE II.—NURSERY GRAFT.

Plate III. shows a form of graftage known as a split or cleft graft, with a single scion. It is applied to stocks of about 1in. in diameter. Fig. 1 shows this scion prepared for insertion into the split in the stock. Fig. 2 depicts the stock as seen from the side opposite to the scion, and the ugly, dangerous split can be readily observed. This stock is also sloped to facilitate the healing process. Fig. 3 shows the scion inserted ready for tying. It can be seen how the barks of stock and scion are fitted. Fig. 4 represents the stock and scion fitted and tied with a waxed band. It is not a very desirable form, as the split never properly heals, though it may be overgrown.

Plate IV. represents the split or cleft graft as commonly applied to large old stocks. Fig. 1 shows the stock as split and held open with a chisel until the scions are inserted. After the split is made, should its edges be bruised or jagged, they must be carefully trimmed and smoothed with a sharp knife.

Figs. 2 and 3 show the scion with the outward (bark) edge and the inner wedge-shaped section respectively. In Fig. 2 it will be seen that a bud is located just at the point where the section begins. Behind this bud a shoulder is made, which rests upon the horizontal surface of the stock when inserted in the cleft. When the scions are adjusted into position the wedge or chisel is withdrawn, and the stock closes back and clamps the scions firmly. They are then tied, and the whole cut surface, from the lowest point of the cleft section on the stock upwards, is carefully waxed to exclude dry air, moisture, and germs of decay. A good number of scions may be inserted in this manner around a large stock, but the method of split-grafting is not conducive to the best health of the tree, for the reasons advanced in respect to the last-named modification of it as applied to young stocks; in fact, in the case of a large tree stock the defects are more aggravated, and the chances of a complete healing much reduced.

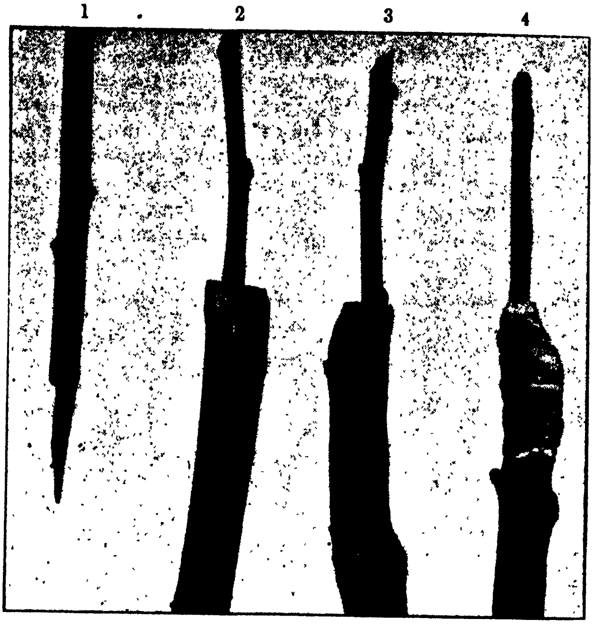

PLATE III.—SPLIT OR CLEFT GRAFT.

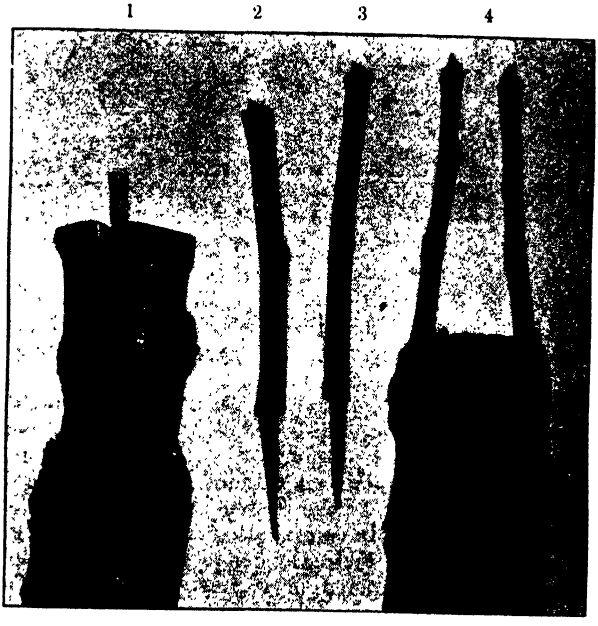

PLATE IV.—SPLIT OR CLEFT GRAFT.

Plate V. depicts a form of bark-grafting. Fig. 1 illustrates a large stock with an incision made in the bark ready for the insertion of the scion, which is shown (Fig. 2). It will be seen that this scion is cut with a horizontal section through three-fourths of the diameter. From this point the cut is sloped away to nothing at the lowest point. From the opposite side

—that is, the bark side—a downward cut is made which makes a wedge point to the scion. A bud is located about half way down this reduced portion.

When the scion is pushed down into the incision made in the bark of the stock the shoulder rests upon the horizontal surface of the stock, and the bud upon the reduced section is about an inch below, merely projecting into the incision. The reason why the point of the scion is made wedge-shaped is because it may be pushed down into the incised stock without the bark from the base of the scion being bruised or crumpled back. This wedge-shaped point also facilitates the operation. The reason why the bud is embedded in the incision in the bark of the stock is an assurance against the work and season being lost should the top of the scion be broken away. If this does not occur the embedded bud remains dormant. After the scions are inserted a string binding is passed around them to secure them in position, and wax is painted over the whole surface operated upon, as in the case of cleft-grafting. Fig. 3 illustrates this when completed.

Bark-grafting has many advantages over the cleft-grafting. It does not injure the stock so permanently, and makes a better union; a greater number of scions can be inserted around a large stock, and the results may be seen sooner. It is performed a little later than the other methods, and can only be done when the bark of the stock lifts readily from the wood — that is, when the sap is in active motion.

PLATE V.—BARK GRAFT APPLIED TO LARGE STOCKS.

The after-care of the grafts is an important matter, and I will take them in serial rotation. Root grafts will require no loosening of the ties, but all the buds, excepting the top one, should be suppressed. If it is intended to shape the trees in the nursery rows, when this shoot attains a height of 18in. it should be cut back to 12in, and a number of shoots to form the main arms of the tree will grow out. If the tree is to be budded —as in the formation of blight-proof apples—allow the shoot to grow straight up, and in the proper season insert a bud at a desired height—not less than 6in. from the ground—of the kind required.

The graft illustrated in Plate II. should retain its bandage closely for several months. All shoots below the union should be suppressed.

The cleft graft in Plate III. requires more careful attention to the binding, owing to the wounds being more severe and taking longer to heal; in fact, the sections near the union should be kept waxed or closely bound until the wounds are healed over completely.

In Plate IV. the cleft graft upon an old or large stock requires still more careful and lengthy attention. All shoots below the union should be removed as soon as seen, and each winter for several years a fresh coat of wax should be painted over the wounded surface. Should more than four scions grow upon a large stock they should be reduced to this number, and as they grow and swelling touch each other at the base an incision made where they touch and waxed over often causes fusion into one stem. Grafts set on old large stocks should be supported when they begin to grow by tying them to a bamboo or stake fastened straight up along the stock and projecting beyond the graft a foot or more. There is no need to untie the binding strings; they decay soon enough.

All the remarks applying to the after-treatment of the cleft graft apply to the bark graft also.

DESTRUCTION OF CHARLOCK, OR WILD MUSTARD.

Careful experiments confirm the statement that a weak solution of sulphate of copper will destroy this and allied weeds, and will not injure cereals. The discovery was made by accident, as was the virtue of bluestone and lime as a preventive of fungus diseases. About three years ago a French vigneron found that charlock plants growing near some sprayed vines had been killed by the bluestone, and the clue thus given was followed up in many quarters with satisfactory results. From the various experiments carried out it would appear that the strength of the solution should not exceed 2 per cent. (2lbs. of sulphate of copper to 10galls. of water), while in many cases a 1 per cent. solution is strong enough. With old plants a stronger solution may be necessary, but the dressing should be applied when young. With a broadcast spraying machine 30galls. to 50galls. will be required to cover an acre of crop. Sulphate of iron has a similar effect, but requires to be made much stronger—8 per cent. to 12 per cent.—and is consequently not so cheap. These compounds act upon charlock and similar weeds because their leaves are rough and the solution therefore remains on them and burns them. The leaves of cereals are smooth and erect, and their texture much closer, hence the solution which proves fatal to one is not injurious to the other. The leaves of charlock have comparatively deep furrows by the side of their midribs and veins in which the solution settles, whereas in corn these are absent.

PRICKLY PEAR, or INDIAN FIG (Opuntia Indica) is really a valuable fodder plant in drought-stricken localities; but the prickles or thorns should be burned off before feeding to stock, else they will collect in the mouth until the animals are prevented in eating. Prickly pear grows best on sandy soil. It has been stated that the thorns become quite soft when the leaves are placed in a silo in layers with green stuff.

MANURES FOR MELONS, &c.—Experiments have been conducted at the Georgia Experiment Station with fertilisers for melons. A number of different mixtures were tested, and it was found that heavy dressings had an injurious effect on the yields, but moderate manuring increased the returns to a profitable extent. The dressing recommended is 500lbs. to 800lbs. per acre of the following mixture:—One thousand pounds superphosphate, 250lbs. muriate of potash, and 500lbs. nitrate soda. Nitrate of soda gave earlier and, on the whole, better returns than other nitrogenous manures. Muriate of potash is better than kainit. The use of a fertiliser of the proportions suggested gave increase over best of the unmanured crops of 50 per cent. to 65 per cent.

FRUIT TREE PRUNING.—No. 6.

By George Quinn, Horticultural Instructor.

The Apple.

Under favorable conditions of soil and climate the apple tree, during the first few years after being planted, makes long vigorous growths. If no pruning is done, these shoots lengthen out of proportion to their stoutness. Owing to the upper buds or leading shoots receiving most sap, the first spurs upon which

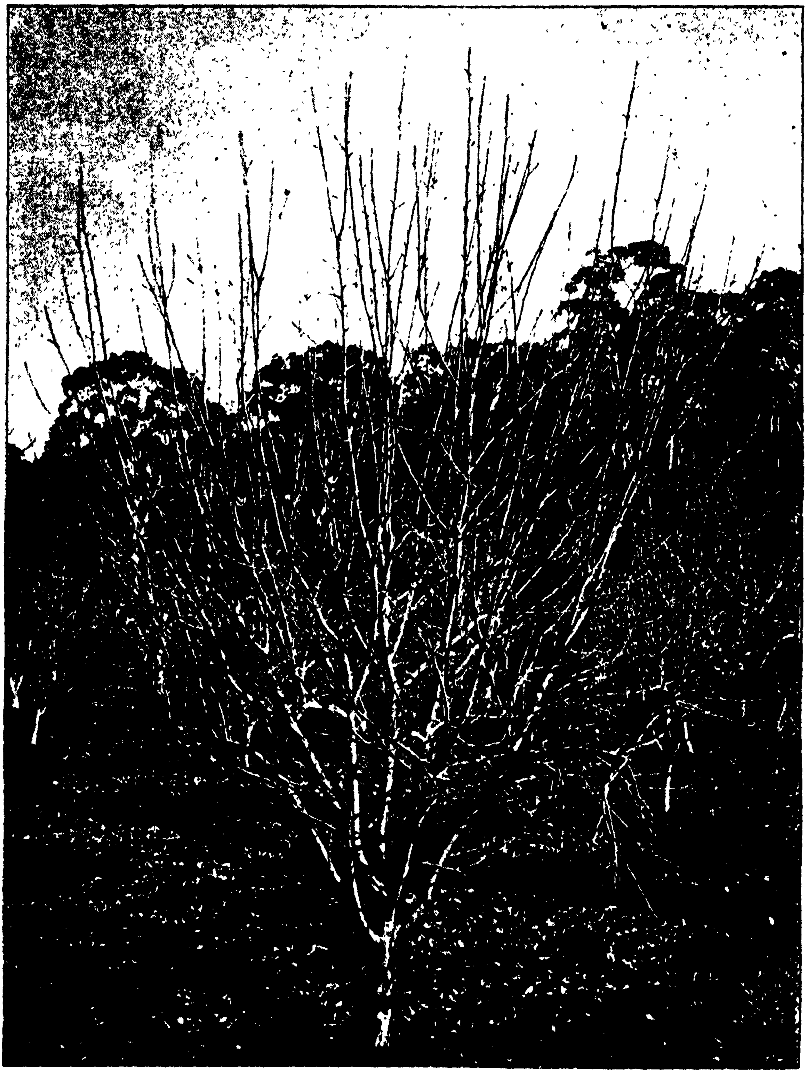

PLATE LV.—ROME BEAUTY APPLE TREE SHOWING OVER-CROWDING OF BRANCHES.

fruits set are invariably formed near the top ends of these shoots. When these fruits are borne the leverage causes long slender shoots to arch over, in proportion to the weight carried, consequently these branches retain in a marked degree the positions they have been forced to assume. The buds of these limbs no longer maintain the ascendancy, but buds which were lower down, either upon those or other shoots less favorably situated formerly, now assume the pride of place, and carry on the vertical development of the tree. These in their turn undergo a similar bending process, and so this operation continues until the gradual production of laterals and fruit-bearing spurs upon the lower

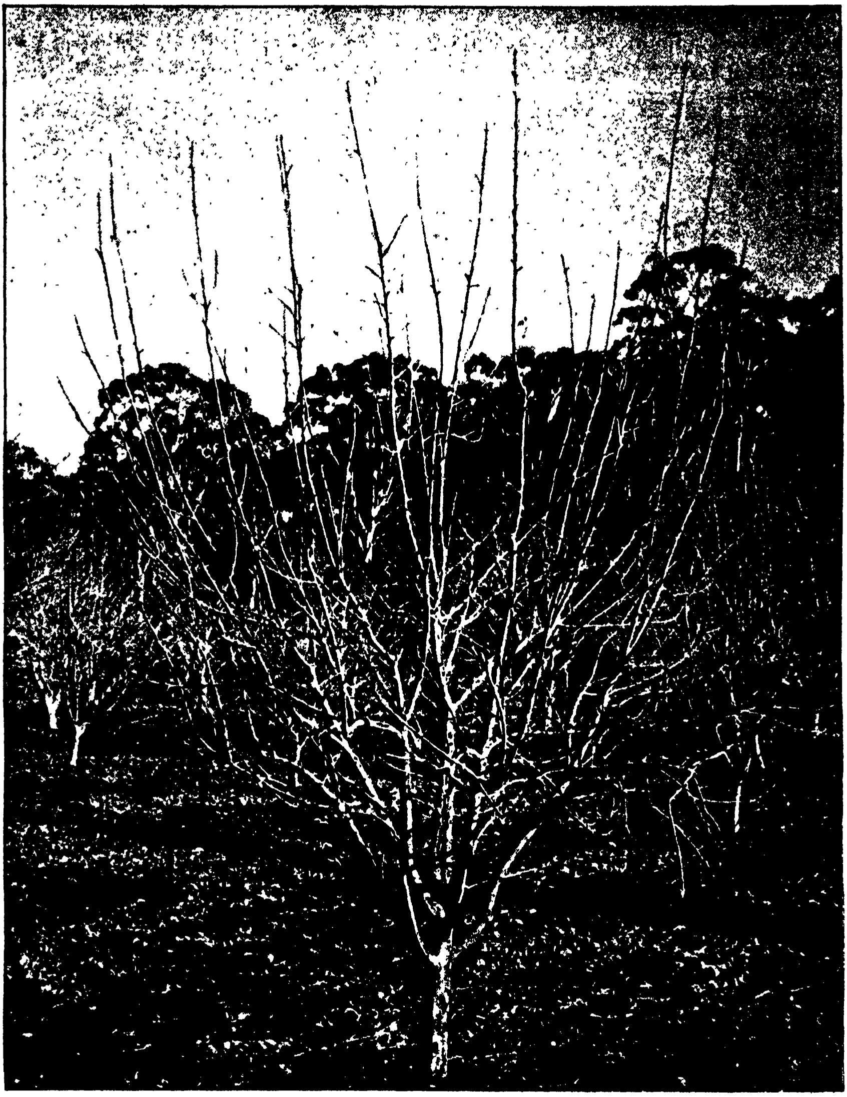

PLATE LVI.—PRUNING APPLIED TO NO. LV. TO REDUCE THE NUMBER OF BRANCHES.

portions of the tree utilises a sufficient quantity of the nutriment absorbed and elaborated to check the growth upon the terminal shoots. It is rightly claimed that this system of non-interference causes the tree to produce fruit earlier than it would under any method of pruning, but its effects in after years are decidedly unprofitable. In dealing with an apple tree the pruner should always remember that it may be expected to last in a fruitful condition for the period of a man's lifetime, or longer, so that the few seasons through which the planter must go unrewarded should not be permitted to overrule his better judgment, which suggests a system of pruning verified by the accumulated experiences of many generations.

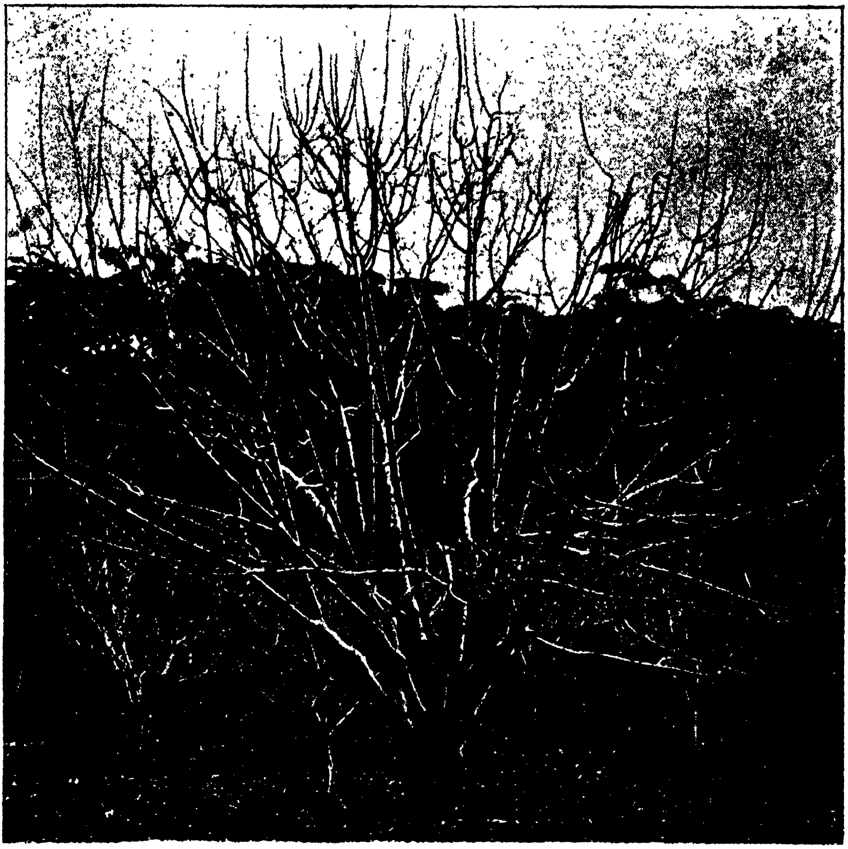

PLATE LVII.—A WELL-SHAPED APPLE TREE.

A vigorous young Rome Beauty apple tree is shown in Plate LV., which illustrates clearly the rapid upward growth of the weak branches, and numbers of these have undergone the "arching" above referred to. This tree was pruned off when set out, but since that time, apparently, little has been done to it. There are scores of subdivisions and crotches in the upper branching system, while great numbers of thin laterals fill up the lower spaces between the foundation arms. The dense carpet-broom-like appearance of this tree when in full foliage can be vividly imagined, and one cannot be surprised at lateral spurs, be they ever so tenacious of life, being blinded out of existence upon all the lower portions of the tree. With young vigorous apple trees this density of growth always has to be contended with; but, by judiciously combining summer and winter treatment, the top can be relieved of surplus shoots, crotches avoided, and, the light being admitted freely, the long thin laterals may be transformed into short sturdy spurs on which eventually good fruits will be carried.

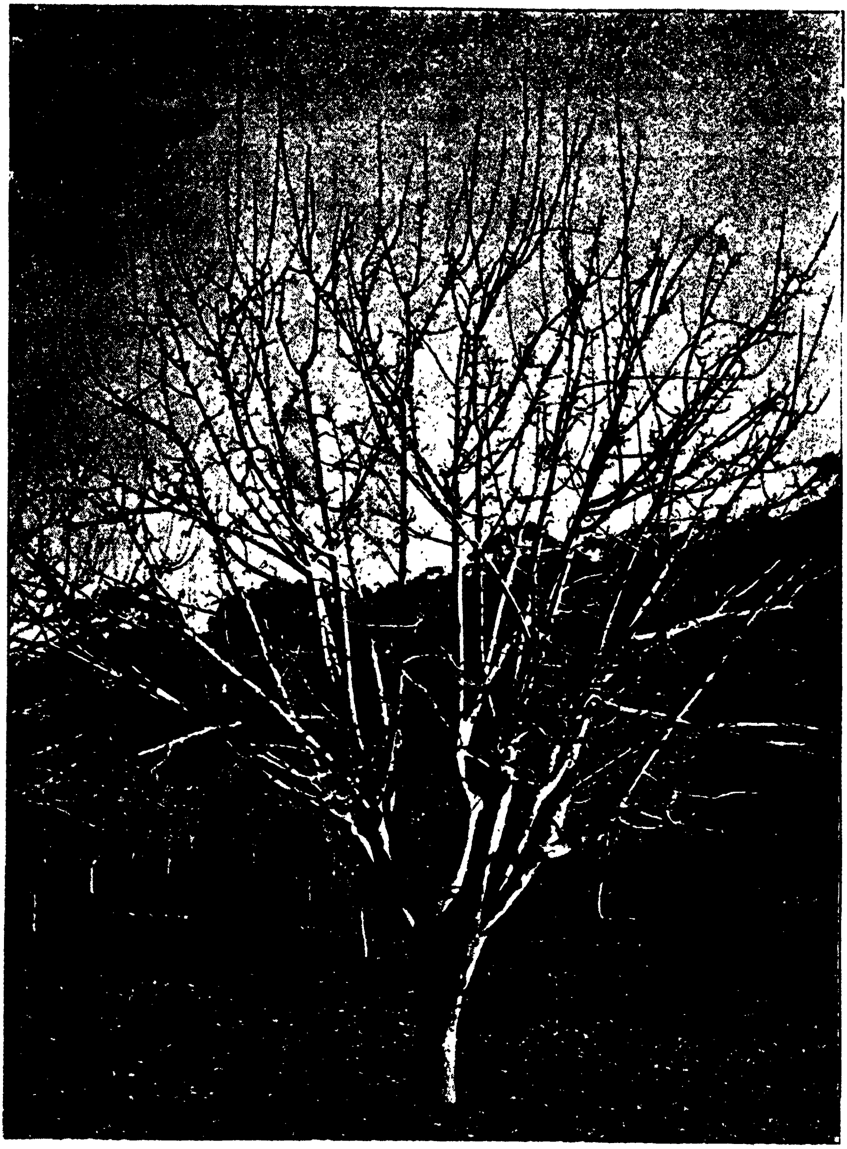

PLATE LVIII.—PRUNING APPLIED TO NO. LVII.

Plate LVI. shows the same tree thinned out considerably, but not pruned down severely at the top of the shoots. If these shoots were shortened-in very much the tree would simply be aggravated to greater exertions to repair the damage, and the difficulty would not be overcome. If the upper portions of these topmost shoots are examined, fruit spurs may be seen in the course of development. If they turn to fruitage no doubt the branches carrying them will bend down, and perhaps some of them break or split off, but the object of turning the tree to a fruitful habit will have been attained, and the pruner may, if he desires to reduce their height, cut away these upper shoots at places lower down, where any other healthy branches have emerged from them.

The large tree of Esopus Spitzenberg, figured in Plate LVII., is a magnificent type of a large orchard tree. It has been regularly trained for the first few seasons after being set, and its main and sub-main arms are strong and well distributed to balance the tree. This tree grows in a well-sheltered and cultivated orchard, and its productiveness is very great. Viewed from the ground upwards, and every consideration weighed, it still possesses some disadvantages. Standing by its trunk, the lowest fruiting wood is out of reach of an ordinary man, though the extremities of the horizontal branches almost reach the ground. The main limbs are pretty well separated, but one is tempted to think many of them have too many feet of bare wood, thus increasing the tree's height without any corresponding gain. The tree has beee pruned on the top for several seasons, and has become somewhat dense in consequence. In training this tree

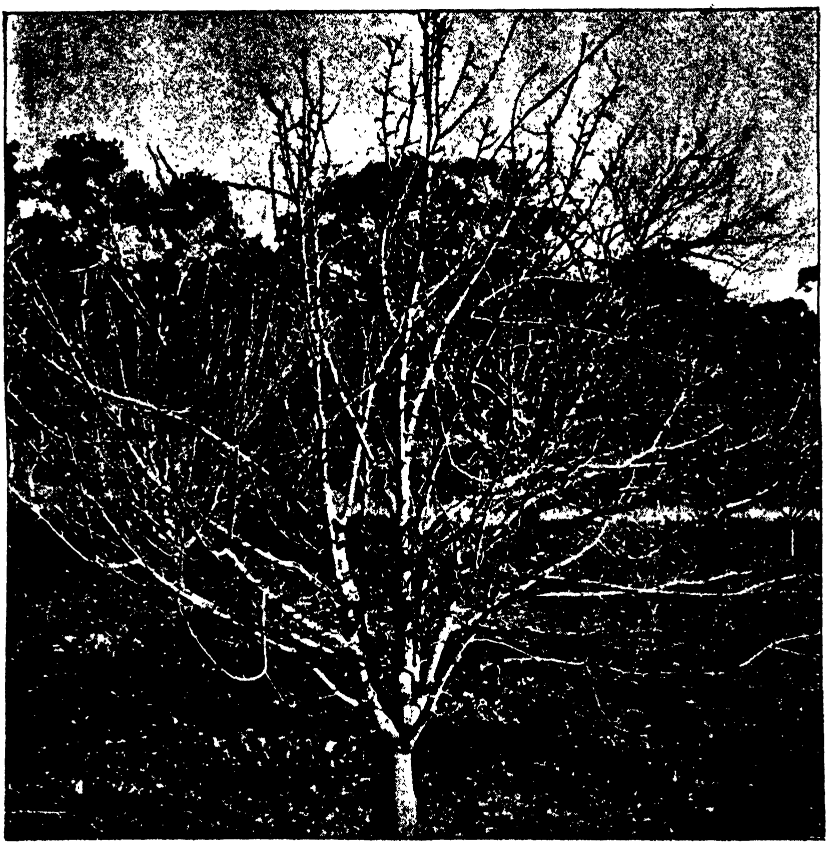

PLATE LIX.–TYPE OF "TWO-STORIED" NONPAREIL APPLE.

it appears that the pruner, after setting the main and sub-main arms, allowed the leading growths to lengthen unduly, and that they were not shortened is seen by the numerous compound crotches—several branches emerging round a limb at pretty well the same level—while at the same time the fruit-bearing laterals were either pruned out or permitted to die on the lower sub-divisions above the trunk. If no high winds, no costly labor for harvesting, and no difficult pests had to be combated, I would almost consider this an ideal tree. The same tree is shown at Plate LVIII., and a considerable quantity of wood has been pruned out of the top branches so as to admit sufficient light into the lower internal laterals, and some of the worst crotches cut out.

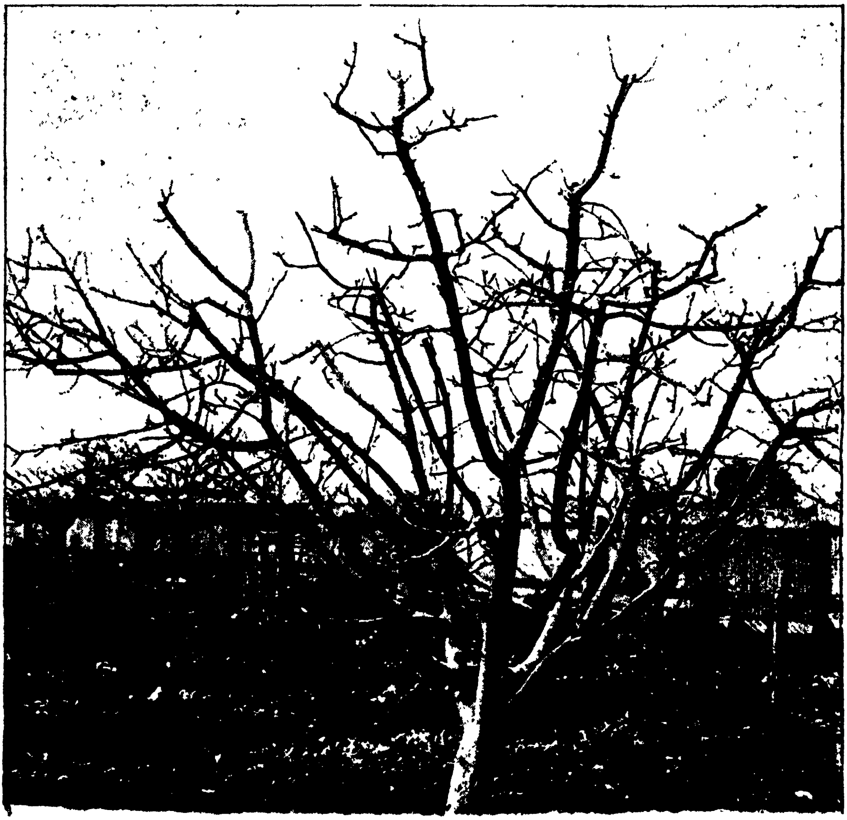

PLATE LX.—APPLE TREE SHOWING ILL-EFFECTS RESULTING FROM CUTTING BACK BRANCHES TO BLIND STUMPS.

In Plate LIX. a Scarlet Nonpareil apple tree is figured. This is a small tree, but the habit of this variety is favorable to such proportions. This specimen represents what the Americans term a "two-storied" type. The central shoot has been allowed to persist, and several tiers of "scaffold limbs" have resulted. These, as the result of circumstances described previously, have turned in many instances to a horizontal position; and, as is usual with this variety, almost every bud along the whole length of each limb has grown into a fruit spur. This variety can be allowed a greater number of main limbs than most kinds, owing to this short spur-forming habit.

The chief objection to a tree of this type is the obstruction it presents to rapid cultivation. The pruning to be applied consists simply of thinning out surplus shoots, and reducing the number of spurs where they are weakly through being too numerous.

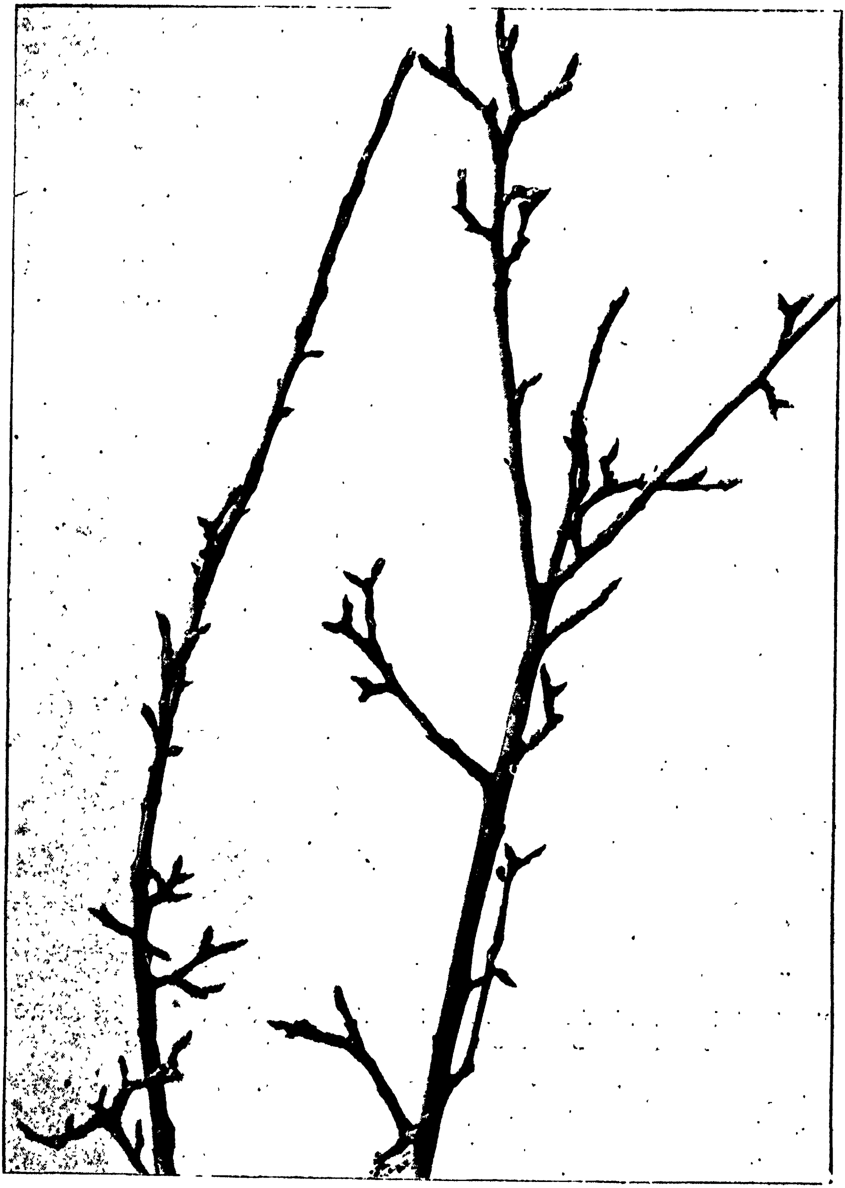

PLATE LXI.—SHOWING SPUR-FORMATION ON APPLE TREES.

Owing principally to the necessity which has arisen of late years for combating various pests, and recognising that fruit trees trained low assist in this work, many growers have tried different methods to obtain this result, and much valuable information respecting the behavior of apple trees under various methods of renovation has been gained in consequence. Excepting under very favorable conditions, when shortening back the top shoots of an apple tree the pruner should be careful never to cut to a blind stub, or over an old fruit spur, but should shorten back to a fork where a good healthy side limb is situated.

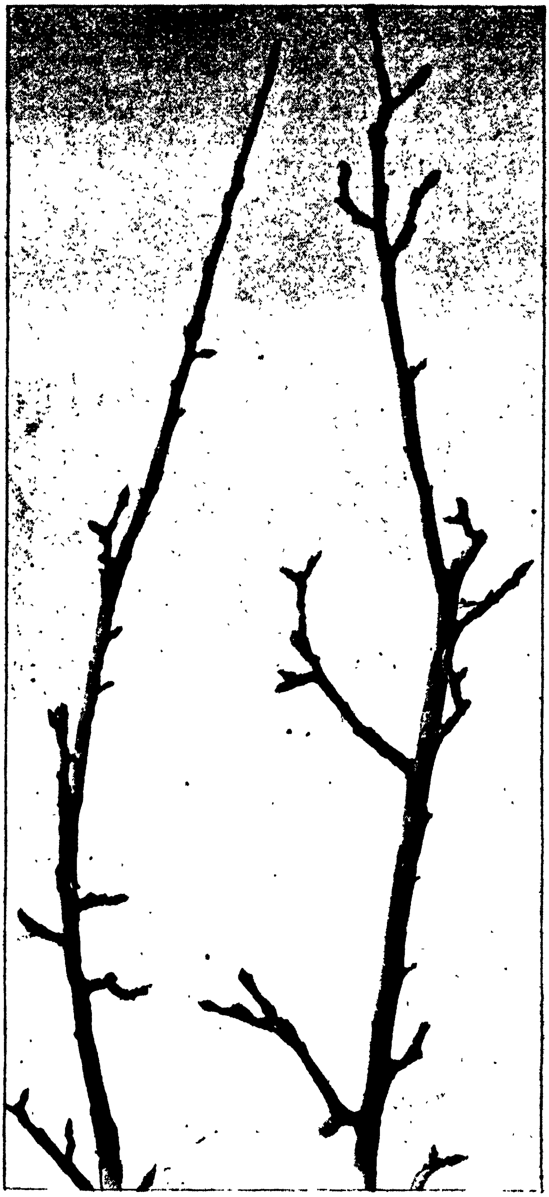

PLATE LXII.—PRUNING OF NO. LXI.

Plate LX. shows the stunting effect of a non-observance of this rule, and upon this tree most of the blind stubs are rapidly dying back, while others have made no appreciable growth since they were cut back two years ago.

I have described and illustrated in Plates LVI. and LVIII. the method of thinning out the leading branches when desirable. In Plate LXI. individual specimens of such branches are depicted. Upon these laterals are carried, and on the laterals in turn fruit-bearing spurs are borne. These laterals are growing without any particular order, and have not been regulated in any way by pruning. It will be noticed that many of the laterals are twisted, and the ramifications caused by the annual sub-division of the spurs gives a fair idea of the tortuous sharp-angled course which the sap has to traverse to reach these terminal bloom buds. On most of these points bunches of blossoms will be carried, out of all proportion to the number of fruits matured. The treatment to be applied to the laterals and spurs on these shoots is shown, somewhat incompletely, in Plate LXII. The laterals have mostly been shortened back, others removed completely, and the spurs thinned out. When reducing the laterals they should be cut back over a short side stub or developing spur. In thinning out spurs, those growths most favorably situated to receive an unchecked supply of sap from the parent shoot should be retained. The thinning of spurs is a very desirable process to apply to any kinds of apples which tend to bear very large quantities of small or inferior fruits. It will also correct, to a certain extent, the alternations of heavy and light cropping so noticeable with some varieties.

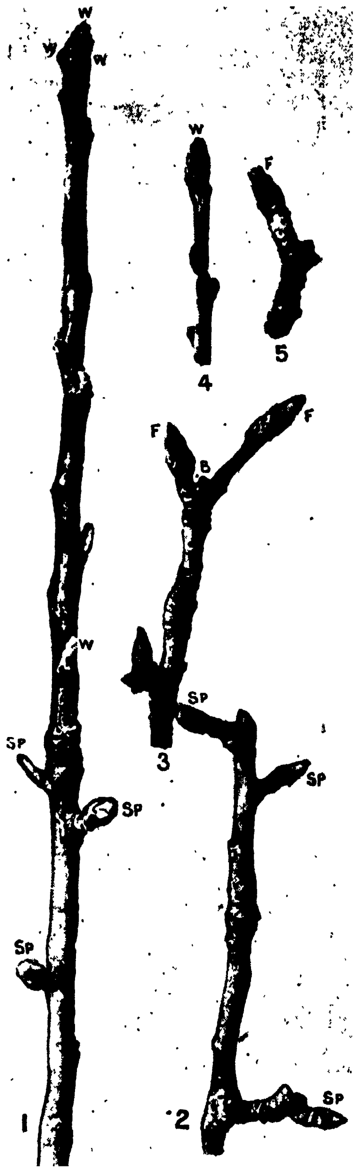

PLATE LXIII—APPLE BUD STUDY.

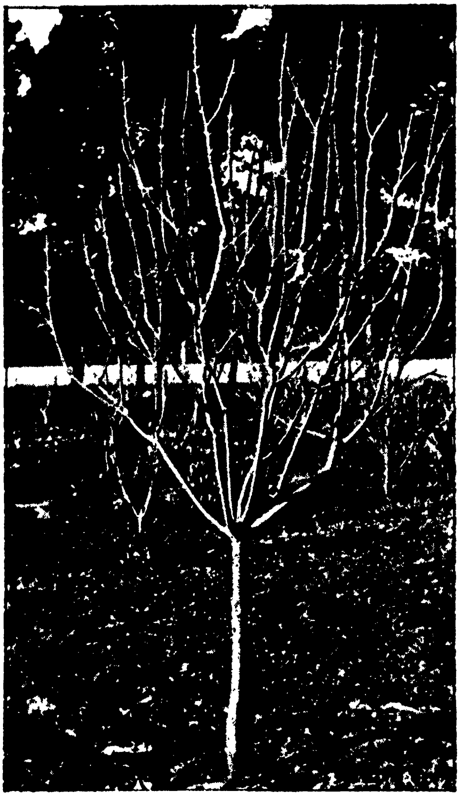

PLATE LXIV.—A FREQUENT ERROR IN TRAINING OF APPLE TREES.

A bud study of the apple is illustrated in Plate LXIII. Fig. 1 is an apple shoot of two years' development. From its base to the concentric rings made by leaf scars opposite the upper SP, the growth is two seasons old. From these rings to the apex W represents the growth made last year. On this growth all the buds are wood or growing buds. This time last year (twelve months ago) the short growths marked SP on the lower portion were identical in appearance with the buds on the upper portion at present. While this upper portion was growing to its present condition these buds grew out into the short stubs seen at SP. Had this been a leading shoot, no doubt the two buds at its base would have grown almost equally with the present length, assumed by last year's shoot. The three buds marked W indicate where a compound crotch may arise in this manner. Fig. 2 represents on its upper half growth of a similar age to that shown on the lower portion of Fig. 1, and the stubs at SP are identical. The lower portion of Fig. 2 is a year older, and carried a stub which has fulfilled its object; it has become a bloom spur. It did not set to fruit, however, for the flower scars are visible, and one of the buds at their base grew on again to SP. The buds on the ends of the stubs or spurs at SP, on Figs. 1 and 2, would bloom this coming spring, thus showing that the apple blooms upon spurs or growths two years or more old. Fig. 3 is a spur cut from one of the shoots figured in a former plate. It is a number of years old, and has branched twice. At B flowers have been borne, and the typical lateral division of the apple spur shown by the two growths marked F. At Fig. 4 a section made through a growing bud is shown. The bud is pointed, and the imbricated bud scales

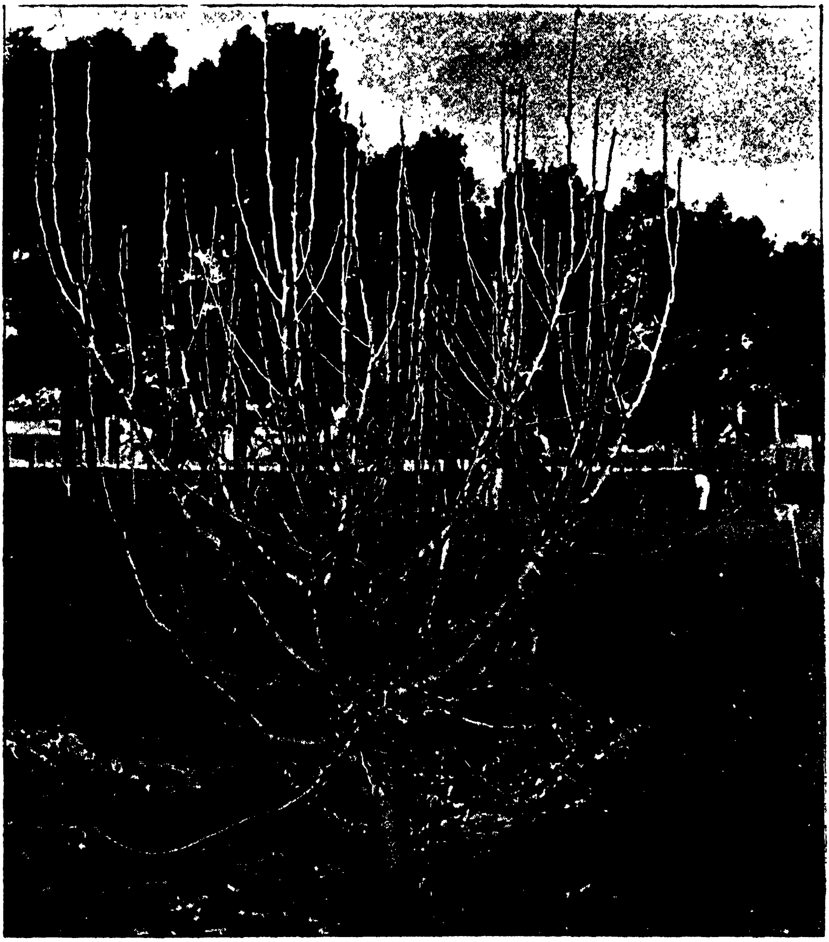

PLATE LXV.–BERGAMONT PEAR TREE TRAINED TO GOBLET-SHAPE.

somewhat parallel. Fig. 5 shows a similar section made through a bloom bud. The crumpled undeveloped bloom cluster can be discerned inside of the bud, which is plumper and less pointed than a wood bud.

We may briefly sum up the pruning of the apple as follows:—During the first three or four winters, prune back short the previous season's growth to form good stout main and substantial arms, and shorten all laterals in considerably—summer pruning the most vigorous of them (method to be described later on)—each year. When these arms are set sturdily, the leading shoots may be allowed to retain 2ft. or 3ft. of growth upon them to check off the rampant growth, and as soon as the tree has gained a thrifty fruiting habit, the pruner should—if he wishes to keep his trees low—take every opportunity to shorten back the main shoots in the manner described heretofore. Root pruning, or allowing the orchard to go uncultivated every second year will check rampant growth; but these practices are scarcely advisable, excepting in those few localities supplied with an abundant rainfall. In choosing the number of main shoots to be retained, and the distances apart to allot them, the lateral or double side-branching habit of the fruit spurs of the apple should be taken into

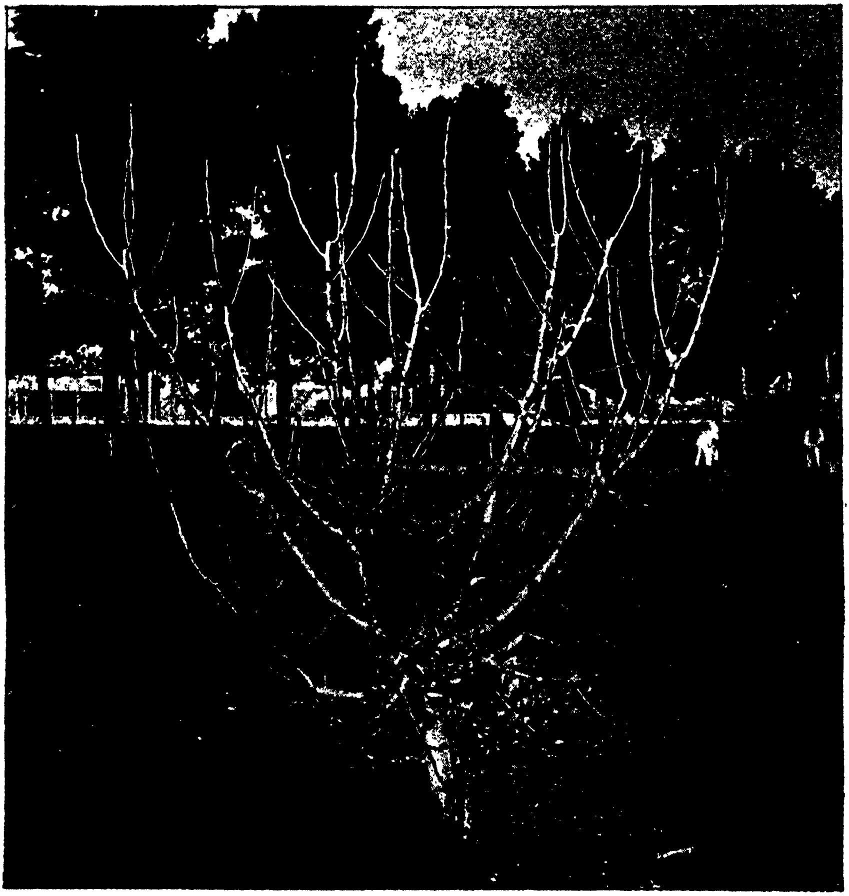

PLATE LXVI.—WINTER PRUNING APPLIED TO NO. LXV.

consideration, in contradistinction to the terminal lengthening of the spurs of the cherry, apricot, &c., which we have formerly examined. This characteristic, so clearly shown on Plate LXI., indicates that more space must be allowed between the spur-carrying limbs of the apple than on those of the cherry.

In Plate LXIV. I give a photograph of a typical young apple tree too frequently found in our gardens at present. It has a stem about 4ft. high, and all the main arms emerging from it have a common centre, like the ribs of an umbrella. It has not borne any fruit yet, but when it does no doubt its resemblance to an umbrella will be more marked.

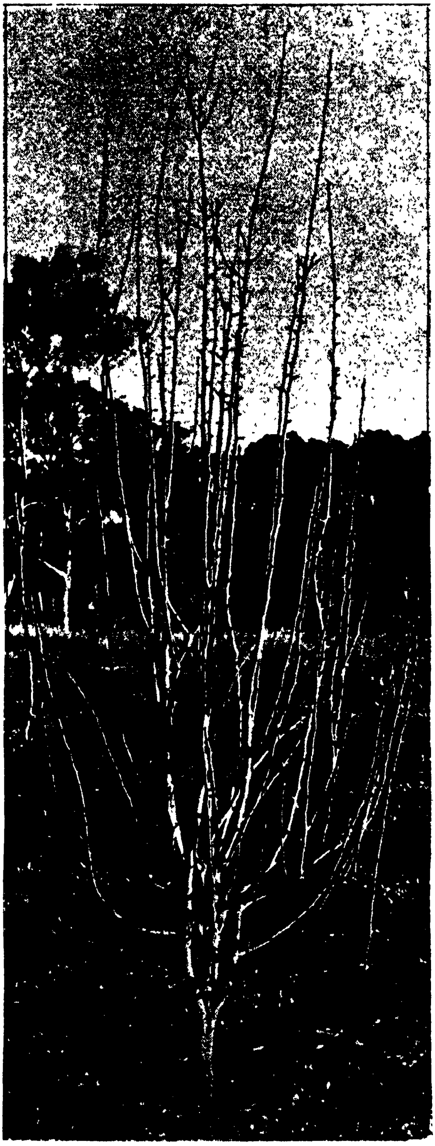

PLATE LXVII.—YOUNG PEAR TREE SHOWING CROWDING OF BRANCHES CAUSED BY NEGLECTING TO PRUNE.

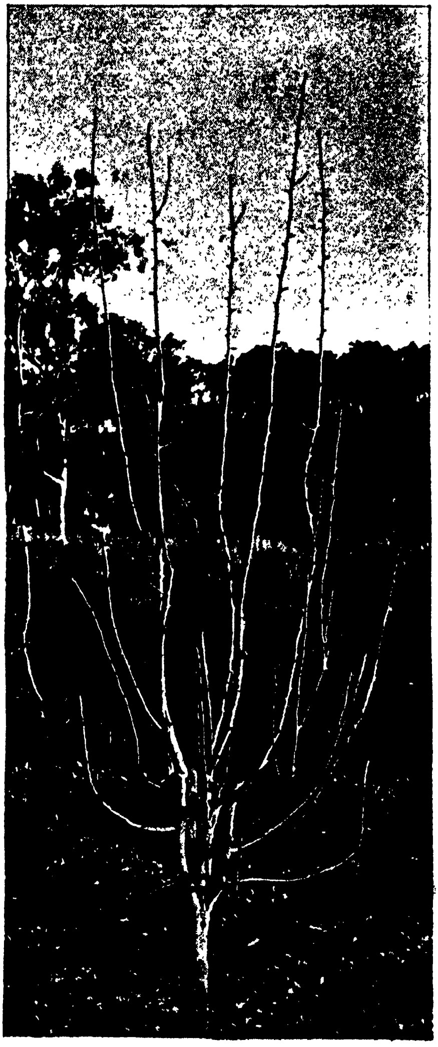

PLATE LXVIII.—NO. LXVII, PRUNED TO FORM GOBLET-SHAPED TREE.

The Pear.

The pear, when planted in a suitable locality, is even more vigorous than the apple for some years after being set out. The natural form to which the tree inclines is that assumed by most coniferous trees. It has been called a pyramid, but it is more accurately described as a cone. The pruning usually applied to pear trees in this colony consists in cutting off the tops of some of the leading shoots for several years after planting and then allowing them to grow unchecked until they become more or less filled with "brushwood."

PLATE LXIX.—L'INCONNUE PEAR TREE OVERLADEN WITH FRUIT, CAUSING BREAKAGE OF LIMBS.

Some of the heavier-bearing kinds split about badly, and then a little cutting away of broken limbs may be practised upon them.

A tree of the variety known as Gansell's Bergamot is illustrated in Plate LXV. This is a very vigorous specimen, and it has been shaped upon the vase system, which has been advocated in these articles as applicable to most kinds of fruit trees. In forming this tree the object aimed at was to have a limited number of main arms ascending gradually, and to clothe them in fruiting spurs in a continuous manner upwards from the junction of each arm with the trunk. It was intended that the centre of the tree should be open, so that sufficient light might be admitted to allow the spurs upon the inner sides of these main arms to develop properly, and carry fruits. The object has to a certain extent been attained, as the spurs first formed near the bases of the main arms have carried a considerable number of fruits. The artificial nature of this method of training is shown in the difficulty experienced in this tree—even with the application of summer pruning—to restrain the activity of the growths coming from the centre.

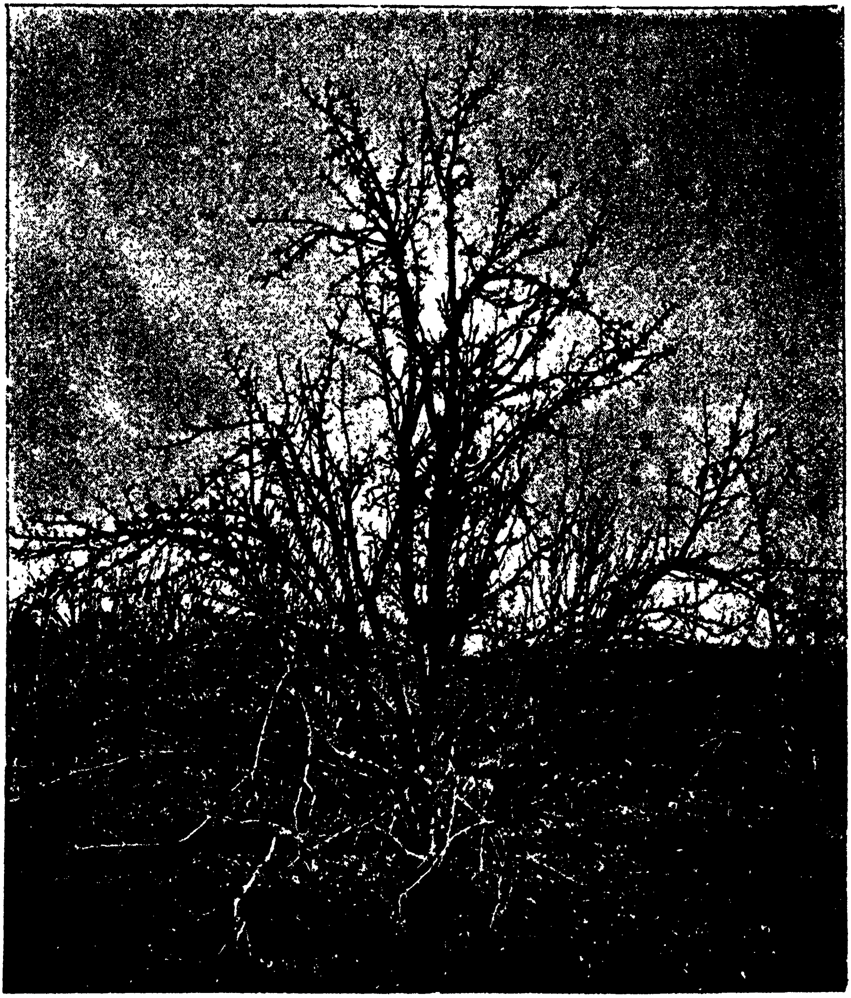

PLATE LXX.—L'INCONNUE PEAR TREE SHOWING ILL-EFFECT OF NEGLECTING TO PRUNE SYSTEMATICALLY.

In Plate LXVI. the pruning of this tree is shown, and a considerable number of the shoots in the centre having been suppressed the objects of the pruner may be more clearly seen. It will be noted that, having secured a set of sturdy foundation arms, the pruner has now permitted a greater length of last-year's leading shoots to remain, with a view to preventing the undue multiplication of such strong shoots as are seen in the centre of Plate LXV.

In Plate LXVII., a young tree of the kind named "L'Inconnue" is photographed. The dense growth is here again noticable. This tree has not, to all appearances, been pruned since it received a heading back at planting time. Many of the shoots are over 6ft. long, testifying to the vigor of the tree. Almost throughout their entire length the buds on some have broken out into spur growths. A close examination of the tree showed those near the top to be about to bloom during the coming spring. There is in this a difficulty and a temptation. The lines followed in the training of this tree have, in comparison to the Bergamot tree just examined, been reversed. Instead of making strong arms and then allowing full play to the upper shoots, the pruner has permitted the leading shoots to run up in a spindly fashion. The owner wishing to train this tree to a vase form, it was pruned as shown in Plate LXVIII. The leading limbs have been thinned out. Those intended to form

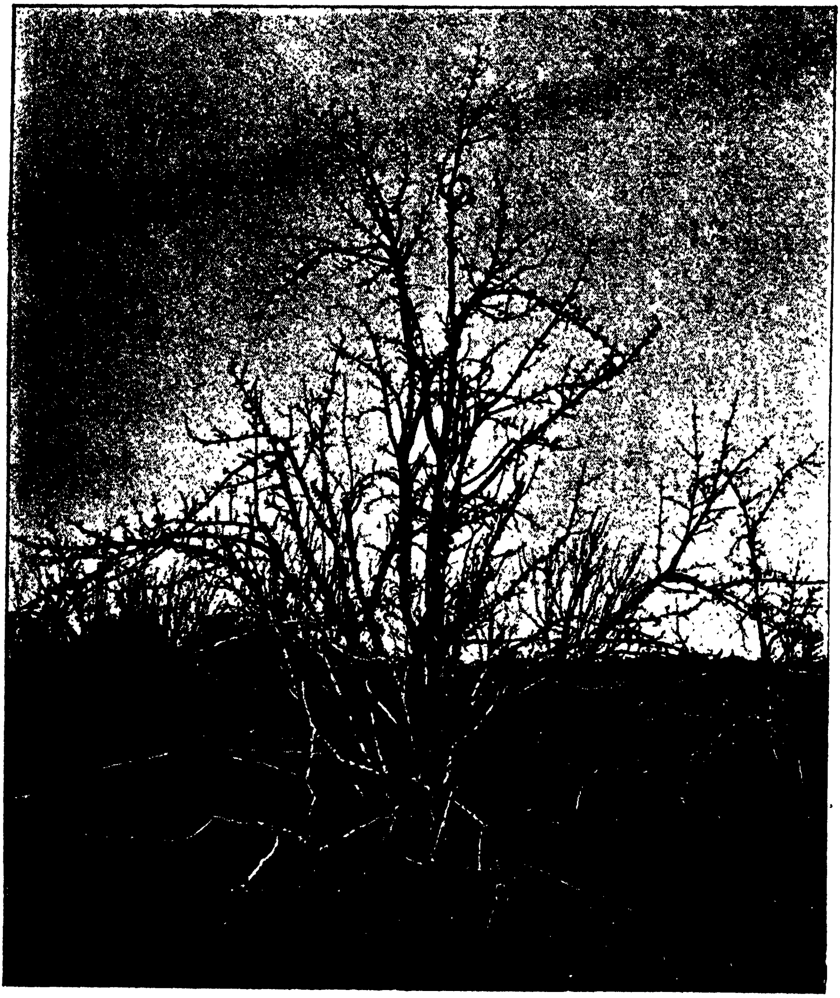

PLATE LXXI.—L'INCONNUE PEAR TREE THINNED OUT TO CORRECT ERRORS ARISING FROM PREVIOUS NEGLECT.

the permanent main arms in future have been cut back severely, to ensure a more sturdy condition, and they will be now permitted to extend more slowly. In order to carry a few fruits and to check as far as possible, by utilising the abundant vigor, the tendency to send up a dense thicket of shoots in the centre, several leading limbs have been allowed to remain there for the present. What would become of this tree, if left entirely unpruned, can be well imagined from the tree figured in Plate LXX., which is of the same

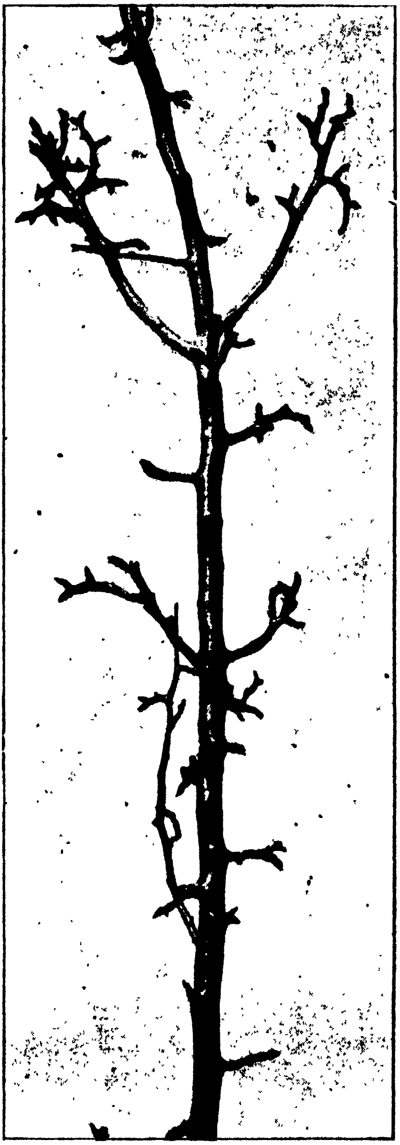

PLATE LXXII.—LATERAL AND SPUR GROWTH OF PEAR TREE.

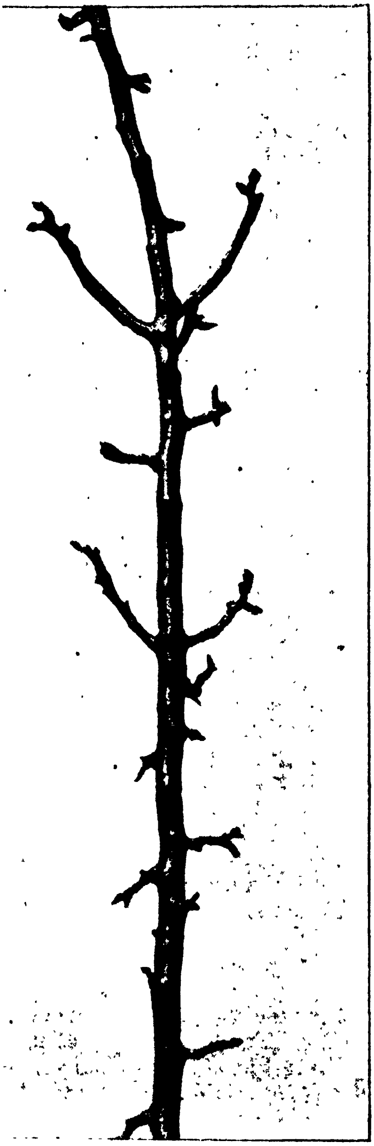

PLATE LXXIII.—SUGGESTED PRUNING OF NO. LXXII.

variety. The photograph shown in Plate LXIX. was taken in the summer of 1898. If the picture is examined, it will be seen that this tree is simply a sprawling mass of pears. The same tree was photographed in July of this year, and is shown in Plate LXX. The effects of this phenomenal yield upon limbs that have ascended slenderly is seen in the number of broken stumps, and the pendulous over-lapping positions assumed by others. This tree is simply a thicket of spur growths. About an hour and a half with saw and seccateur reduced these, to the extent of about two wheelbarrow loads, and the tree carrying the remainder is seen at Plate LXXI.

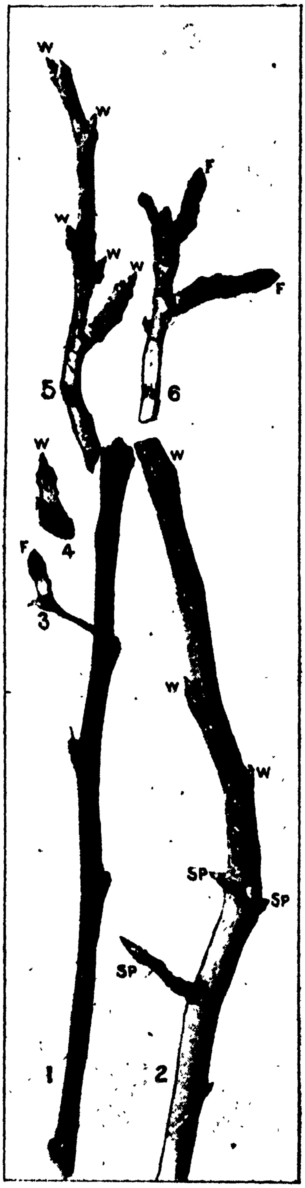

PLATE LXXIV.—PEAR BUD STUDY.

Plate LXXII. is an individual branch cut from this tree, and the treatment applied to it is shown in Plate LXXIII. It will be noticed that the treatment is very similar to that applied to the apple shoots, with this distinction, that on the pear the spurs are kept shortened back nearer to the main limb—as usually, with some varieties of pears, fruits borne upon spurs set on fairly long laterals are more liable to be blown off than apples would be. Besides, if full grown pears swing and bump against each other or against a branch, their chances of keeping are small indeed.

A bud and spur study of the pear is illustrated on Plate LXXIV. Fig 1 is a shoot made last year, and all the buds are wood buds. At its apex three buds are placed almost on the same level. When these start to grow, a three-pronged sort of development results, forming a double fork, which is not only weak in itself, but retards the flow of sap to the growths above. Fig. 2 consists of the growth of two years. On top the shoot is identical with Fig. 1. Below the bend short pointed spurs are seen at SP. These will, under ordinary circumstances, become flower or fruit spurs, but at present they are simply stunted laterals, not having assumed the functions of blooming and fruit-carrying as yet. These sharp-pointed spurs will be two years old next summer, and as they have not set bloom buds it will be readily understood that the pear does not fruit on growths under two years old; it is often more than three years before the spurs on young trees even bloom. Fig. 3 is a section cut vertically through a bloom bud. Inside, the folded cluster of bloom buds is readily seen. Fig. 4 is a similar section through a growing or wood bud. It is sharp pointed, and the bud scales press closely upon each other, allowing no room for internal bud clusters as seen in the previous figure. Fig. 5 is a lateral, carrying spurs and buds destined to become spurs. All of the sharp-pointed buds marked W are growing buds, and would not bloom in the coming spring. Fig. 6 is a spur which has branched twice and bloomed. The buds seen upon these branches of the spurs at F are flower buds, and would bloom in the coming spring.

A Vicar of Winkfield pear tree, over-loaded with fruit, is seen in Plate LXXV. Plate LXXVI. shows the same tree photographed after the fruits were gathered and the foliage had fallen. How clearly the evil results of rapid ascension, without proportionate stoutness being attained, is depicted in this tree! The tangled disorder which follows the neglect of systematic pruning is seen here. Out of this chaos of bent and crossing limbs one can see very clearly the shape the tree endeavored to assume prior to the disturbance of its equilibrium by the weight of fruit which it tried to carry. In spite of the many shoots which arose, and were allowed to persist, in the centre, one of them gained the upper hand, and at present rises above its fellows. If my readers can imagine the number of these branches being regulated from the beginning, and kept at appropriate distances from each other around the central stem, this central stem only being permitted to add a foot or two to its height each season, and the side branches only being allowed a similar annual lengthening. without any sub-divisions taking place upon them, all laterals coming from them to be summer pruned

PLATE LXXV.—VICAR OF WINKFIELD PEAR TREE SHOWING SHAPE NATURAL TO THE PEAR TREE.

and transformed into spurs—a tree trained steadily and strongly upon these lines would present a fruiting surface as large and more regular than is seen upon this tree in Plate LXXV., and the gradual extension of limbs and stem would insure that stability capable of carrying, without breaking, the heavy crops of fruits which pear trees produce in this climate. A pear tree trimmed upon these lines into a conical shape would possess a much greater fruiting surface at a given height from the ground than one grown to a vase shape, as shown in Plate LXVI. Its greatest fruiting surface would be nearest to the ground, whereas, with the vase-shaped tree, the ascending branches are broadening out, and the largest area for the production of fruit must ultimately be upon the highest plane. If Plate LXVI. be held upside down the student will see the conical shape advocated for the pear.

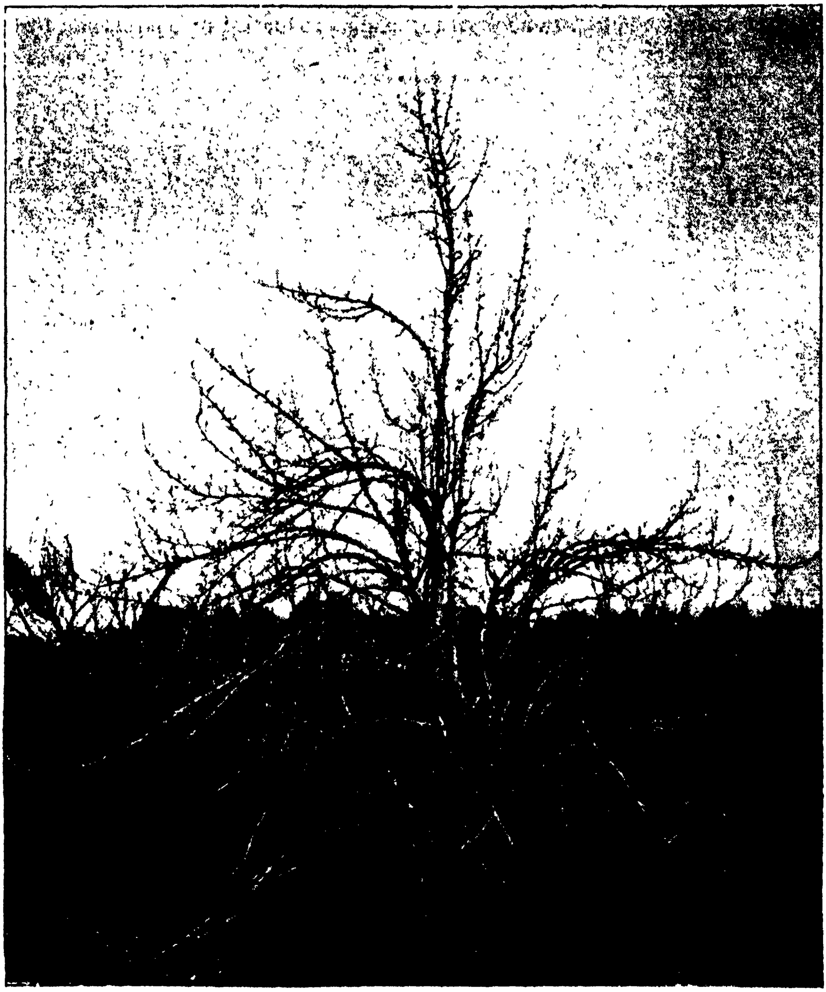

PLATE LXXVI.—NO. LXXV. WITHOUT FOLIAGE.

The Quince.

The climate of South Australia has proved so favorable to the growth of this fruit that usually the trees are allotted the less frequented corners of the gardens, or are planted as hedges, or may be as a break to line the otherwise unused bank of a creek which passes through the orchard. Under a system of almost absolute neglect they bear freely, and I have heard it asserted that, at 1s. 6d. per bushel, they are as profitable as any fruit grown.

When any fruit is abundant it generally follows that those of the finest quality obtain the first demand; and it is with this belief, and because I think more profit could be made from the production of this fruit, that I make the following remarks upon its habits of growth and fruit production, and the pruning found most conducive to the production of fruit of high quality.

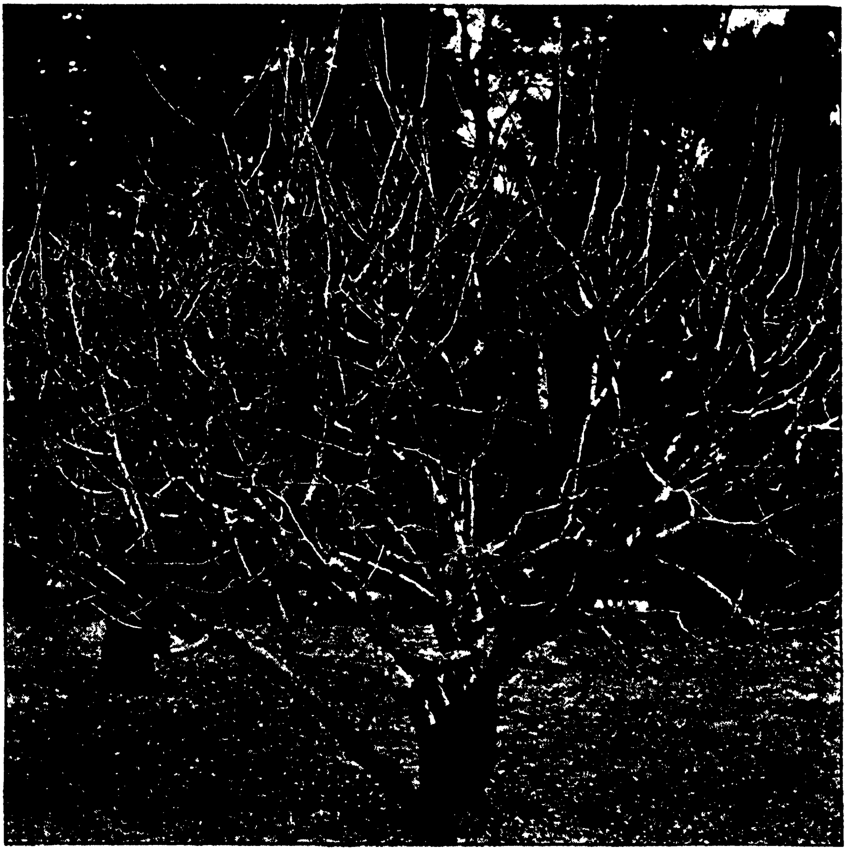

PLATE LXXVII.—TYPE OF QUINCE TREE BADLY PRUNED.

For the first few seasons after planting a quince tree should be pruned severely, to set a good shape—a low sturdy bush. The result of this severe pruning will be to cause it to send up an enormous mass of slender branchless shoots, but this cannot well be overcome, nor can they be turned to account as fruit spurs by summer pruning, as advocated for minimising this evil upon the apple and pear. While active growth is in operation numbers may be rubbed off where they are not wanted, and each winter pruning should remove all of those not required for shaping the tree.

When the desired shape and sturdiness has been attained, the shoots should still be thinned considerably, but it is not wise to shorten the topmost ones severely—in fact they could be left untouched. This is done to induce fruitfulness When a fruiting habit has been secured these topmost branches will arch over, and the subsequent annual pruning consists of removing all water-shoots—shoots emerging directly from old wood—and systematically thinning out the lateral and leading growths to permit sufficient light to reach each one retained.

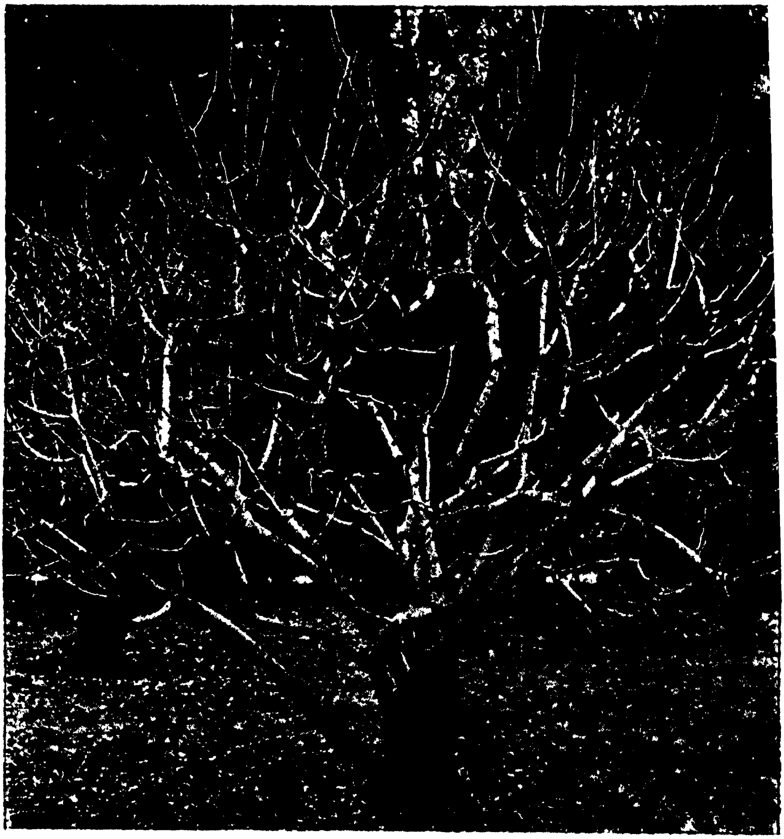

PLATE LXXVIII.—PRUNING SUGGESTED FOR NO. LXXVII.

The tree shown in Plate LXXVII. is of a very productive nature. It is typical of the average quince tree found in our gardens. Allowed to shape itself and grow without interference, its twisted and crossed main arms are a study in disorder. In later years it has been severely topped, and above its compound trunks may be seen abundance of water-shoots as the inevitable result of this practice.

Plate LXXVIII. shows the same tree thinned out, both as regards the leading and lateral shoots. The annual growths at the top have not been severely pruned, but all the water-shoots are removed.

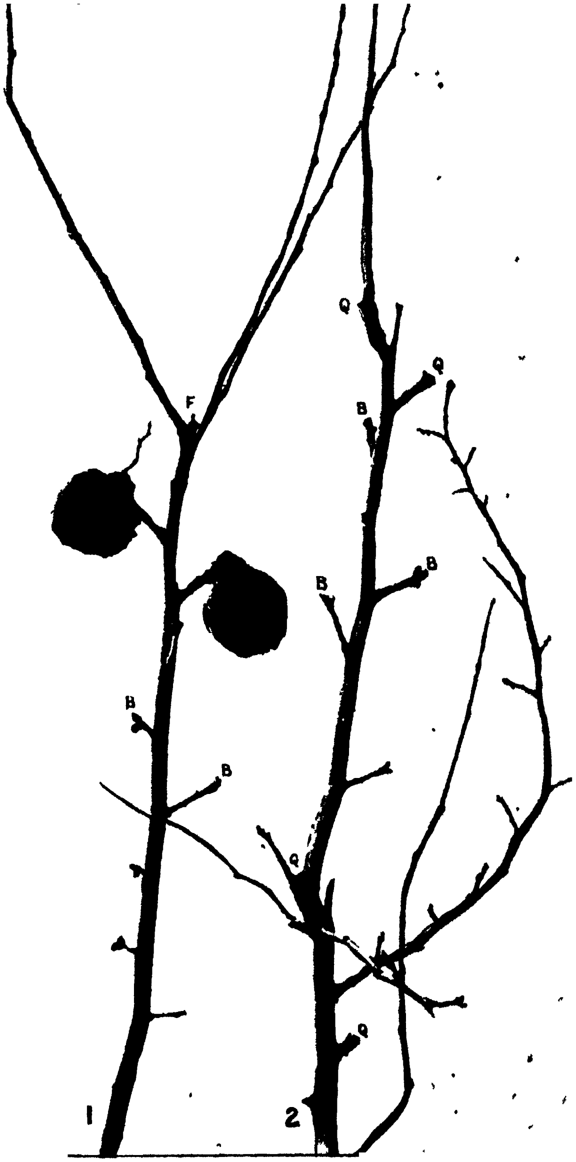

PLATE LXXIX.—QUINCE SHOOTS SHOWING FORMATION OF FRUIT BUDS.

On Plate LXXIX. two shoots taken from this tree are figured. No. 1 was a strong terminal growth, and from its lower end to the base, from which three shoots arise, is two years old. On it are a number of stiff truncated twigs, and upon two of these old sun-dried fruits still adhere. From just above the upper dried fruit to the top of the branch the three growths are of last year's production. Twelve months ago the buds from which these truncated twigs arose were identical with the present appearance of those seen on the three twigs above F. Last winter the pruner severed the shoot just where a slight bend is seen above the topmost dried quince. Nearly all the buds from the base upwards started into growth, and the upper ones bloomed, two of which set into fruits. The highest one grew (F) and bloomed only. The buds upon this flower base threw out the three shoots seen at the top, and the others matured their fruits. Fig. 2 carries wood one year older than the branch just described. Two winters ago it was pruned at the stump seen in the angle opposite the second Q from the base. Next season it set a quince below at Q, and sent out several thin laterals, while at the second Q a fruit was matured, and at its base a shoot grew to the pruned stump seen where the straight growth ends between the two upper Q's. Last summer this shoot bloomed and set two fruits just referred to, while the topmost shoot was continued to its terminal point. It will be noticed that short spur-like growths were made by a thin curved lateral on the side.

Plate LXXX. conveys an idea of the pruning practised upon these limbs. The dried quince is merely left for illustrative purposes.

A study of buds and shoots is shown on Plate LXXXI. The first figure is a shoot which grew to Q, where a fruit was borne; alongside this a bud developed, and grew the succeeding year to F and bloomed. Other growths were made, and now at the terminal points marked B may be seen the peculiar double bud formation of the quince. These two buds are almost on the same level, but the one which will lengthen and bloom always starts first; in fact, often starts alone. These buds are the larger in each pair. Fig. 2. is a lateral twig of last year's growth. Fig. 3 this time last year was identical with Fig. 2, but while that lateral was growing, the twig at Fig. 3 thickened and its buds sent out the short spurs seen upon it. Some of these might have carried fruit in the coming summer if left untouched. The tendency of the quince to send out vast numbers of these spindly laterals necessitates that frequent thinning out should be practised to prevent over

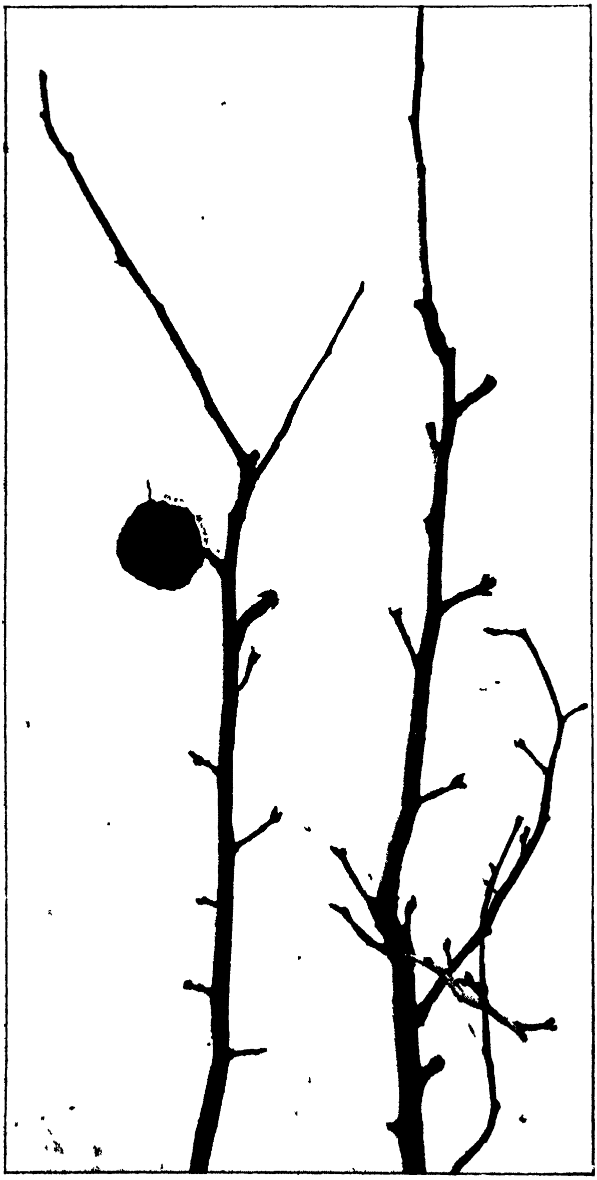

PLATE LXXX.—SUGGESTED PRUNING OF NO. LXXIX.

density in the top of the tree. Fig. 4 is simply an enlarged view of the top of Fig. 1, as shown in Plate LXXX. These studies show us that the quince will bear fruits on strong shoots made in the previous year, but the weaker laterals take two or more seasons to reach a fruiting stage. For further information respecting the extension fruit-bearing wood refer back to Plate XVIII.

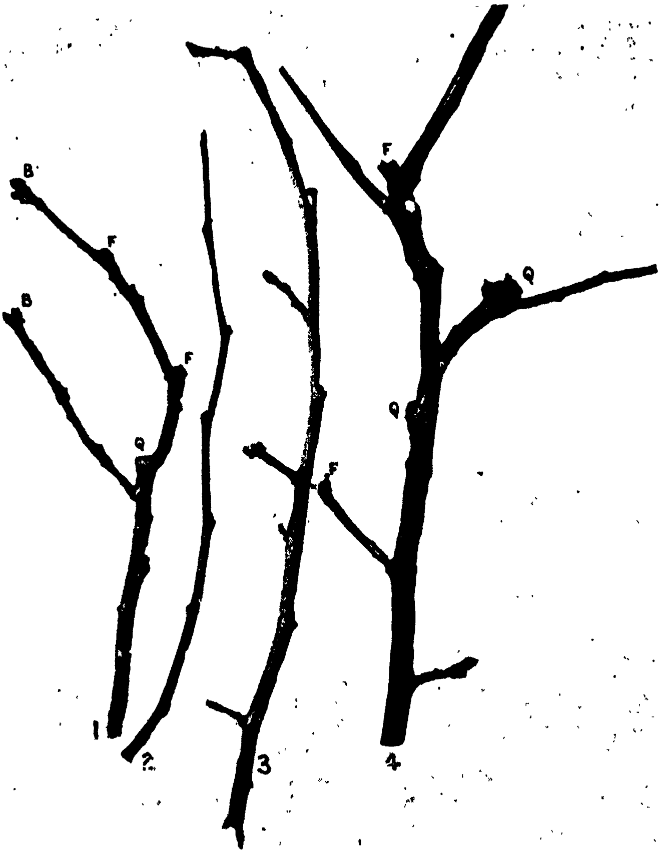

PLATE LXXXI.—STUDY OF QUINCE SHOOTS.

Lucern Hay.—Lucern deteriorates very rapidly in food value after the early blossoming stage. The best stage to cut it for hay is when the plants are about one-third in bloom. When the plant has passed the full blooming stage it shows a marked decrease in digestible matter, and there is a possibility of injury to stock from accumulation of fibrous matter in the stomach.

Lime Pickle for Eggs.—Take 3½lbs. good fresh lime, place in pail, and pour over sufficient water to slake it, then add 2pts. of salt. To 8galls. of water, which has previously been boiled, add the lime and salt; stir well and allow it to settle. Stir it up again thoroughly, and when settled pour the clear liquid over the eggs.

ORCHARD NOTES FOR SEPTEMBER

By George Quinn, Horticultural Instructor.

With the exceptions found in a few elevated districts the winter months are rapidly passing away without fulfilling the promise of a soaked subsoil which seemed so certain in June. The scanty but gentle rains that have fallen this year have, however, entered the soil, and where the course of cultivation indicated in our monthly notes has been carried into effect, no doubt a fair amount has been stored in the subsoil. The cultivation to be carried out now is to conserve it there as long as possible. In some early localities the second ploughing with a shallow furrow should be pretty well completed, in others it should be now in hand. This should throw the soil back to its normal position, and the usual evenness of surface restored. As soon as this is done, the cultivator or scarifier should start, before the clods harden, and the surface be broken into a fine tilth, thus placing a fine loose mulch over the moist underlayer and checking rapid evaporation. These scarifyings should be repeated as soon as the ground is workable after every rain, otherwise a crust forms, and evaporation is stimulated. Those who have left their orchards unploughed till now should not plough deeply, because they turn up and sacrifice much moisture which should at this stage remain below. Further, most deciduous trees have been sending out roots actively of late, and the dry top soil would be thrown back upon the broken remains of those cut by the shares. This is a serious matter, because the good strong early start made by the roots in the spring enables them to penetrate the moisture-laden layers of soil, and so maintain sufficient strength and vigor to develop their wood and fruit.

This is a very good time to apply quickly dissolving manures such as superphosphate, nitrate of soda, and muriate or sulphate of potash. These should be sown around young trees, taking in a foot or two outside the radius of the branches. In old, impoverished orchards the whole of the surface should be dressed, but the greater proportion should be given in the first-named manner.

Locally we have no reliable results of tests made upon orchard trees, but American and European experiences, with due consideration to the character of our own soils, point to 5cwts. superphosphate, 1cwt. nitrate of soda, and 1cwt. of either of the above forms of potash as a good basis for trial upon fairly large trees. Trees set 20ft. apart allow about 109 on an acre, so that these quantities would run about 5lbs. super, 1lb. nitrate of soda, 1lb. potash per tree.

As the month proceeds it may be necessary to go over all newly-planted trees and regulate the shoots emerging from the stems. This precaution will often save a lot of later pruning, and in settling the main arms may prove of the utmost value.

The pruning of citrus trees may be undertaken now. In the early stages of development these trees require very careful manipulation, and while the limbs should not be exposed to the direct rays of the sun or the drying effects of the warm winds, no effort should be spared to thin out the clustering twigs which always form in the centre. The aim should be to allow those which are retained to have room to receive enough light to develop stoutly. Crossing branches should be removed now, and all dead twigs suppressed back to healthy wood.

On many citrus trees the terminal points are bare and dying back. This is usually the result of cold winds or frost. These should be shortened back to healthy green wood.

The pruning of citrus trees has a strong bearing on the repression of scale insects, more especially "black scale," and it requires but very casual observing powers to note the comparative absence of this pest on trees through which air and light find easy access. The planting of citrus trees should now be well in hand. In selecting ground see to the good under-drainage; neglect of this is ultimately fatal to these trees. Without good windbreaks it is useless to attempt the culture of citrus fruits here. Provision for irrigation must be at hand in almost all our districts. When planting, keep the trees pretty well above ground, so that when the earth has settled to a normal condition the junction of roots and stem may be visible. Secure small healthy green trees from 15in. to 24in. high for preference. If many roots are lost, or have to be removed owing to drying or bruising, reduce the leaf or stem area in proportion. If the stems or limbs are unsupplied with sheltering foliage, wind strips of rag or bagging loosely around all the exposed portions. This will protect them from vermin as well as sun scalding. Give the trees a good soaking of water when set out.

The grafting of deciduous trees is usually done now. An illustrated article on the subject is republished in this issue.

In the matter of pests, in late localities sprayings with Bordeaux mixture may be applied for different parasitic fungi, and until the blossoms open the usual winter strength can be applied with perfect safety. Peach aphides are likely to be troublesome if the spring remains dry. The best spray I have used or seen used for this pest is the tobacco and soap wash, made by using 2ozs. of the strongest tobacco and 3ozs. soap to each gallon of water. Some of this can also be poured around the stems of affected trees. The secret of checking this pest lies in detecting and treating the trees in the early stages of the attack, and following up the applications at close intervals. On the authority of Buckton and other famed entomologists we are assured that these insects mature in four days, and then reproduce living young that are all females maturing and breeding in a similar manner. With this in mind, the above seems perfectly reasonable.

The cleaning up of rubbish and the scraping of tree stems in orchards infested by codlin moth should be rigorously pushed on now, for after the first few warm days the loose bark dries and cracks off. Even trees scraped cleanly in early winter always show a little just now. Fruit-rooms in which apples or pears are stored should be looked to and made sufficiently tight to prevent the escape of moths which will hatch inside. I am confident that until more attention is paid to this matter there will be always a serious leakage and much disappointment with results obtained from outdoor operations. As it is, the intention of the Department to more rigorously enforce the law respecting these matters, now that information *re* its requirements has been scattered broadcast, it will be well for those who have observed the required precautions in a perfunctory manner in the past to take a hint and be up and doing.

NOTES ON VEGETABLE-GROWING FOR SEPTEMBER.

By George Quinn, Horticultural Instructor.

This is an important month in the vegetable garden. The out-door sowings of cucumbers, marrows, pumpkins, trombones, water, pie, and sweet melons, will be made. These plants like organic manures rich in nitrogen. Composted weeds, or rich stable or cow manure, buried deeply and mixed with the soil suits them admirably. Care should be taken not to place the seeds too closely in contact with these fertilising agents, or the young plants may be injured. Some successful growers sow the seeds in long continuous rows, and others in patches a few feet apart. Any young plants of the melon family raised in frames should be hardened off by gentle gradual exposure to the light and air during the day, and on warm nights only. After they are hardy they may be planted out if shelter is afforded. A piece of canvas suspended above and on the sides exposed to winds is ample.

Tomatoes will be ready for planting out now, and these should be sheltered from cutting winds and possible frosts. A common method of sheltering is to split kerosene tins diagonally, leaving the top on one piece and the bottom on the other. This forms a roof while the triangular sides ward off the prevailing breezes.

If the weather continues dry, mulch the surface surrounding all melons and tomatoes with broken manure.

Sowings of tomatoes could be made either in beds for successional plantings, or in the spots where they are intended to remain

Beets of all kinds should be thinned out, and sowings may be continued. Every garden should grow these for summer use. The green tops of the silver beet are equal to spinach, and the boiled roots of red beet make an excellent relish.

Sowings of radish, cress, lettuce, &c., for salad purposes should now be made in shady spots, otherwise the plants will be tough and tasteless in summer.

Peas should be staked and kept climbing to same. In small gardens wire netting makes an excellent support.

Carrots and parsnips should be thinned out carefully, as one good root is worth many twisted fibrous specimens, which result from crowding.

Plant onions in late localities, and sow silver-skinned varieties very thickly for pickling purposes.

Make sowings of dwarf and runner beans, covering the seeds with old loose manure to assist even germination. The beans should be scalded in hot water before sowing. The hot water (not quite boiling) should be poured over the beans, and then allowed to remain in contact with them until quite cold. The water could then be poured off, and the beans allowed to dry for an hour or so. This is necessary to toughen the skins, otherwise in the operation of sowing the seed lobes fall asunder owing to the skin peeling off.

Keep surface of all beds loose by means of the hoe or fork, and work in quickly dissolving manures where rain or artificial watering is available.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J. Perkins, Government Viticulturist.

The winter has had a very dry closing, and unless we are favored with an exceptionally wet spring, the chances of good growth in our much-tried vines are very problematic. Those few who may have had recourse to the use of manures during the present season are not fated, I am afraid, to see much results from their labors. Manures, however soluble, cannot act unless dissolved and spread through the soil by the action of copious rains. Even, however, under the present inauspicious conditions, the money and time given to manuring is not wholly thrown away. Our winter rains are practically never sufficiently heavy to wash it away beyond the reach of the roots in the dormant season. What therefore cannot be utilised during the present season, will act beneficently during the following one. Meanwhile it cannot be too strongly recommended to keep the surface soil loose and free from weeds. With the opening of the present month, under normal conditions, the plough should be discarded for the scarifier, and the surface soil should resume its normal evenness. It is just possible that September may prove a wet month, in which case, let us make the most of it. Winter rains have been short, let us store up what little we can collect form the tardy, and alas! problematic spring fall. However often it may be necessary to stir up the soil, let us not shrink from it; let us remember that a caked, weedy surface wastes gallons of water that should go towards refreshing the drought-stricken plants. Avoid the use of harrows; they tend to consolidate the soil even more effectively than a roller; leave them to the wheat-grower, who requires them; for us the horse-hoe or scarifier does better and more effective work.

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Let those who have suitable spots and the means of applying moderate irrigation now plant out their cuttings beds. There is every chance of vine planting being resumed again with some of its old vigor, and those who can rear rooted vines may reap some profit from the operation without very much expense. Of late years Carbenet, Shiraz, and Malbeck rooted vines have been almost exclusively reared, and yet, judging from the constant inquiries that reach me, there is a very real demand for some few of the heavier bearing varieties, could they be obtained, the despised Mataro amongst others. It might not prove an unprofitable speculation to root a few.

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Vine grafting should be resorted to now wherever there is any intention of having recourse to it. And here let me comment on an heretical view on the subject which has occasionally reached me. Doubts as to the success of grafts is frequently expressed on the score of continued dry weather. Let me say, that more favorable weather for the take of grafts than a dry spring could not be desired. There is nothing that militates more against the success of grafts than an excess of moisture around the joint; it maintains the soil at a low temperature and hinders the development of the healing tissue. This is particularly the case where unnecessarily deep grafting is adopted, as in many places in the colony. Let not, therefore, a fear of continued dry weather interfere with grafting operations.

Do not graft more than ¼in. below the level of the soil, and mound over the graft completely with new soil, preferably sand.

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It will not be long ere the vines burst into leaf, and it is as well that we should be on our guard against the occurrence of late frosts. Smoke clouds, be it understood, are when properly handled absolutely effective against the effects of nocturnal radiation, the main cause of these frosts. Where the latter are fairly constant spring visitors, it will be as well to make full provision for their reception. Anything that will make a dense heavy smoke will fulfil all that is required. The smoke should cover the whole area under a continuous blanket, to be started as soon as a thermometer, placed at about the same height as the shoots, and exposed to nocturnal radiation, marks 33° F. or 34° F., and to be continued, unless the sky becomes overclouded, until about one hour after sunrise. Unfortunately, such a treatment remains absolutely ineffective against what are known as *black frosts*, as opposed to ordinary hoar frosts. These black frosts are due to a sudden return to winter weather, to a general lowering of the temperature over a whole country, and against them we are unfortunately powerless. We can but hope that after last year's hail we shall be spared their unwelcome visits.

WINE AND CELLAR NOTES.

By Arthur J. Perkins.

September should prove a very busy month in all cellars. It is the universal experience of all wine-making countries that with the return of warm weather *every* wine in the cellar should be racked off its lees. This, the most important racking of the year, coincides with the bursting of the buds of the vine, and should be carried out with all celerity during the course of this month. The *raison d'etre* of its importance can readily be understood; low temperature favors the deposit of both matters in suspension and in solution in the wine; its dissolving power is reduced to a minimum, and more or less insoluble salts are thrown down with the lees; the wine becomes bright, having undergone a sort of natural fining. The first effect of rising temperature is the expansion of the gases in solution in the wine, and more particularly of carbonic acid gas. This of itself causes a slight disturbance in the liquid and its lees, rendering it more or less turbid unless rapidly drawn off the sediment. Further, the yeast cells and other germs present in the lees seem awakened to new life, and show a tendency to threaten not only its condition but even its soundness. From all these points of view it is imperative to bear in mind that every wine should be racked with the return of warm weather.

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Only the other day I had a very good illustration of the effect of this rise in temperature, however slight, combined perhaps with partial aeration. A sample of wine was forwarded me that had been filtered bright, and yet had subsequently turned turbid again. It had been found that by running the wine into a sulphured cask this turbidity could to a certain extent be avoided. I had received three samples—A (unfiltered), B (filtered), and C (lees.) I examined all three under the microscope. The lees were clean and healthy, and presented nothing abnormal; the unfiltered wine showed a few yeast cells in a more or less dormant state; the filtered wine was full of yeast cells in full development; and yet the wine was almost dry!

I question whether it is altogether wise to ship wines under three years betwixt the beginning of August and end of September. It frequently occurs during this period that I have to reject samples for the London depôt because they reach me fermenting in bottle.

FOR BEEKEEPERS.

Bar-framed Hives.

It was publicly stated a short time ago, at a meeting near Woodside, that foul brood in bees was not prevalent in this colony until bar-frame hives were introduced. This statement has no foundation in truth, but, on the contrary, the foul brood disease was extremely prevalent before the bar-frame hives came into use here. Neither is it a fact, as stated, that bees are more susceptible to disease through being "coddled" in bar-frame hives. On the contrary, it is now comparatively easy to deal with diseases when they do occur; and, whilst the bees are quite as hardy as ever they have been, the facilities afforded by the bar-frame hive enable the beekeeper to cure diseases, and thus the danger of contagion is avoided.

Bee Stings.

Bee stings are not pleasant to any person, and some people suffer very acutely from even one sting. Numerous are the remedies recommended, and few are truly effectual in affording relief. There is one, however, which never fails if applied within a minute or two after the sting is inflicted. That remedy is liquid ammonia. Scrape the sting off with a knife and rub in the remedy. Do not attempt to pull the sting out by aid of the fingers, because the poison bag of the bee is attached to the sting, and, by squeezing it, the whole of the poison will be injected into the flesh. The pain is relieved very quickly, and no evil effect follows.

Handling Queens.

The only proper way to capture or handle a queen bee is by taking her up by the wings between the thumb and finger, or else gently by the thorax. She hardly ever uses her sting, except to kill a rival queen. Never attempt to catch the queen bee by the legs or lower portion of the body, nor catch her in a hurry, else there is likely to be an accident. Some beekeepers make it a practice to clip the wings of the queen, so that when a swarm issues she can easily be found and placed with her family in a new hive. This should only be done when the beekeeper is always ready to take the swarm, else the queen will be lost. It is best to clip off about two-thirds of the length of the wings, holding the queen close over the top of the frames, so that, when she falls, no injury shall result Be very careful not to cut her legs off, or to injure her by undue pressure on her thorax. If lifted by the four wings and turned upside down, she will cast her abdomen upwards and bunch her legs.

Queenless Stocks.

When the queen is lost, the continuance of the colony of bees is only a matter of a week or two. No fresh addition of bees is possible, and the workers know that there is no use in gathering stores At this time of the year the bees ought to be very active, and the queen should be exceedingly prolific. When examining the frames, take note if there are eggs in the brood combs If there are not numerous eggs or "grubs" (young bees) in the comb, try at once to find the queen. If not found, supply a queen at once. If found, mark the hive as doubtful—the queen may be barren or infertile. If no eggs or brood are found seven days later, put in a fresh queen and kill the old one.

Uniting Weak Colonies.

At this time of year it may happen that some of the colonies are weak; but it is very desirable that they should be quite strong. Each colony should be able to cover three frames completely. They can be strengthened by uniting two, or even three, colonies. The colonies to be united should be pretty close together, and, if separated by more than 20ft., bring the hives a little nearer each night till they are side by side. Then at night blow smoke into each hive through the entrance; lift the cover, and blow a few puffs between the frames in each hive. Remove the unoccupied frames from one hive; push the occupied combs to one side; place a spare comb alongside the occupied combs; then lift the occupied combs from the other hive and place in the one to be strengthened, next to the spare comb; fill up with spare comb, give another puff of smoke, and cover up again. It is best to remove one queen, but some people leave them to fight it out.

Feeding.

If any hive is not stored up with enough honey to keep the bees supplied with food, it is necessary to give them enough to carry on with. It may happen that a few wet, cold, cloudy days may occur, and the bees can gather no honey, and starvation will follow if they are not fed. Mix the food as follows:—For every pound of sugar add half a pint of water, half a teaspoonful of vinegar, and a small pinch of salt. Mix well, bring it to a boil, and be careful to stir all the time. Feed a little every evening in a shallow vessel on top of the frames, but under the cover, and put in a float or lay in a piece of flannel, so that the bees cannot be drowned. If there is some liquid food already in the combs it may still be necessary to feed with dry crystal sugar or candy, which may be placed in shallow trays on top of the frames.

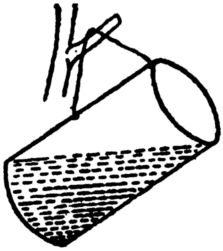
Water for Bees.

Bees must have access to cool and clear water. Where there is no running stream or standing pool, supply them with water in shallow dishes placed in the shade, and be sure to have several slats or other floats on the surface, else many bees will be drowned. Make it a daily practice to see that the vessels are supplied with water.

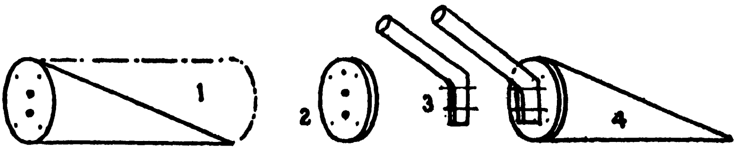
HELPS IN THE HOUSEHOLD.

How to Utilise Old Tin Cans.

Tin cans are by no means to be despised when the original contents have been abstracted. They can be utilised for many purposes. For trapping moths of all kinds, the small tins may be used in place of the expensive glass vessels. They are partly filled with a mixture of one tablespoonful of boiled apple and another of sugar, in a quart of water, and hung up amongst the branches of apple and pear trees, thus:—

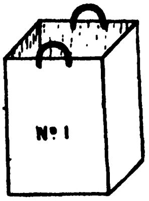


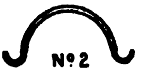
Tins of any moderate size can be made into useful scoops by cutting them to shape, (1) thus:—



Affix a circular piece of wood (2) on the end, turn over the edge on top, pin it down with tacks, and make a handle (3) with a heel to it, so that it can be fixed on with screws. Turn and double down the edges of the tin to the outside, so that the contents of the scoop (4) when used may run clear of obstruction.

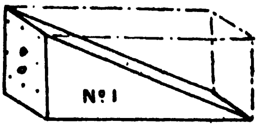
Kerosene cans may be used for cooking purposes, and may be cut down to any convenient size and fitted with loops or handles, either for hanging or lifting. As buckets for carrying water, or any liquids (except corrosive acids), they are very convenient. By snipping down the four corners after the top is off, and neatly turning down the edges, a double strength of rim is formed, and then two holes in each end will carry iron wire loops to form ears for lifting by (No. 1). If desired to hang the vessel over a fire, or to lift it off the bars, a looped wire handle can be used, made as shown (No. 2).

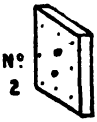


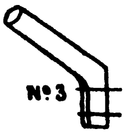


Small tins can be used in arid districts to maintain life in favorite plants, by making a pinhole at the bottom, bury to the top in the soil alongside the plant, and fill with water three or four times a week. By placing a number of them in a fire they will become unsoldered, and then are very handy in which to raise carob trees and other plants. They should be laid on a hard floor close together, filled evenly all over with good light sandy loam, one seed or more placed in each, and when the plants are in the fourth leaf remove all but the strongest in each tin, and plant them out in the tins (as they are) in the place where the trees are needed to grow, watering as required until they are well established.

A large scoop, or a useful ashpan and firescoop, can be easily made from an old kerosene can, as shown here :—





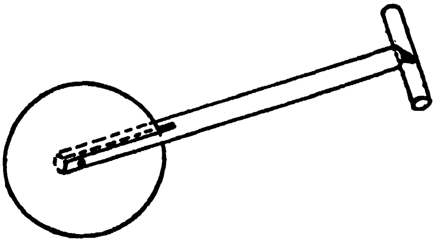


No. 1 shows how the tin is to be cut, with a piece left at the back to fold and fasten over a thin piece of board, which is nailed to the back of the scoop. No. 2 is the flat board, and No. 3 is the handle, with heel to be affixed by screws to the board. The edges of the tin should be turned down outwardly to strengthen the sides and lip.

HELPS FOR FARMERS.

Runner-cutter for Strawberries.

There is much time and labor lost in cutting the runners of strawberries during summer, when both time and labor are least at disposal. Fresh runners are constantly being produced. This little implement will expeditethe work.

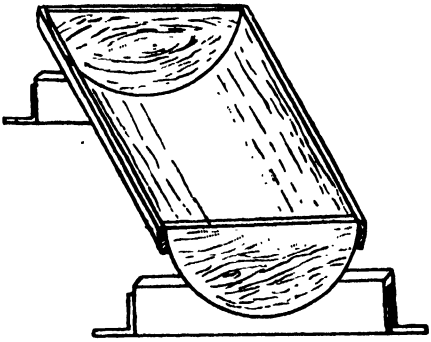


Cut a circle of 20in. to 24in. diameter out of a good thick piece of sheet iron; sharpen up the edge with a rasp or on a grindstone; saw a slit 12in.

long in a suitable piece of wood for a handle ; put on a cross piece to wheel it by ; put a bolt through the centre of the iron and affix it to the handle, as shown in the illustration. This will cut the runners on either side of the rows as quickly as it can be run along.

An Easily-made Pig Trough.

Mr. T. H. Casley, of Mount Remarkable Branch, sends the annexed sketch of a pig trough :—



and says he uses no other, although he can get plenty of hollow logs. These are more easily made, durable, and are kept clean by the pigs. Any old galvanized sheet iron (if corrugated, beat it out flat) will do, and soft wood cut to shape for the ends—not more than 6in. deep. The iron should be wide enough to turn over the side battens to prevent the pigs biting the wood. Nail iron on the edges of the end pieces also, driving the nails zigzag (˙ . ˙ . ˙) to prevent splitting. Fix on blocks as shown. The top edge of the trough should not stand more than 9in. above the ground

A CASE OF EQUINE TUBERCULOSIS.

By T. H. Williams, Inspector of Stock.

Tuberculosis of the horse is of rare occurrence, but the writer recently had the opportunity of seeing a well-marked case (August 20, 1899). About January last a cart mare, nine years of age, developed a slight cough ; by degrees this became more distressing, and a quantity of thick yellow sputum was expelled from the lungs. The mare wasted and grew weak. Some of the sputum was obtained, submitted to microscopical examination, and the bacilli of tuberculosis found. The *post mortem* revealed extensive invasions of the lungs by masses of tubercular nodules. The pericardium was invaded on one side. No trace of the disease could be found in the liver, mesentary, or intestines. The stomach contained a great number of worms. It is probable another mare which fed from the same feed box is affected, as a slight cough has been noticed. The origin of the above case is somewhat obscure, though the mare is believed to have fed on the same pasture with tuberculous cattle destroyed about three years ago.

Four-fifths of the atmosphere consists of nitrogen, and nitrogen is the dearest thing farmers have to purchase for the fertilisation of their soil. Its office is to build up the plant, and it is especially useful in vegetable gardens. Most of the pod-seeded plants—such as clover and beans—are able to absorb or take up nitrogen from the air, and to store it also in the roots.

AGRICULTURAL AND LIVE STOCK STATISTICS, 1898-9.

Distribution of Land.

Division.	Leasehold.	Freehold.	Cultivated.
	Acres.	Acres.	Acres.
Central.			
Total 1898-9	3,663,360	2,224,956	1,012,253
Total 1897-8	3,475,968	2,151,404	912,113
Lower North.			
Total 1898-9	4,913,840	2,062,437	888,864
Total 1897-8	4,805,959	1,953,871	776,388
Upper North.			
Total 1898-9	8,343,272	675,652	804,420
Total 1897-8	8,060,518	632,975	700,044
South-Eastern.			
Total 1898-9	3,705,412	1,300,288	101,935
Total 1897-8	3,644,937	1,208,627	81,682
Western.			
Total 1898-9	8,551,747	140,934	159,898
Total 1897-8	8,580,897	140,618	133,895
Grand total 1898-9	29,177,631	6,413,267	2,967,370
Grand total 1897-8	28,568,279	6,087,495	2,604,122

Crops under Grain.

	Wheat.		Barley.	Oats.
	Acres.	Produce.	Produce.	Produce.
		Bushels.	Bushels.	Bushels.
Central.				
Total 1898-9	544,901	3,589,237	124,130	146,774
Total 1897-8	420,789	1,420,387	88,719	112,870
Lower North.				
Total 1898-9	526,842	2,825,500	19,407	33,004
Total 1897-8	441,397	1,368,432	13,577	29,739
Upper North.				
Total 1898-9	531,712	1,380,624	4,832	—
Total 1897-8	510,754	653,216	1,033	270
South-Eastern.				
Total 1898-9	49,725	525,544	74,754	119,217
Total 1897-8	30,116	262,476	45,769	59,312
Western.				
Total 1898-9	135,590	457,995	11,012	5,007
Total 1897-8	119,612	310,341	12,967	2,253
Grand total 1898-9	1,788,770	8,778,900	234,135	304,002
Grand total 1897-8	1,522,668	4,014,862	162,065	204,444

The area under barley was 16,962 acres, as against 13,232 acres in 1897-8, and the area under oats 25,823 acres, as against 31,398 acres.

AGRICULTURAL AND LIVE STOCK STATISTICS—*continued.*

VITICULTURAL STATISTICS.

	Acres.	Wine from Vintage 1898.	Grapes Sold.	Raisins Made.	Currants Dried.
		Galls.	Cwts.	Cwts.	Cwts.
		Central.			
Total 1898-9	15,877	1,016,082	119,940	1,595	822
Total 1897-8	15,642	1,215,309	168,286	1,682	637
		Lower North.			
Total 1898-9	2,450	40,490	5,387	4,572	305
Total 1897-8	2,302	49,380	6,284	2,444	230
		Upper North.			
Total 1898-9	348	—	2,122	17	5
Total 1897-8	341	245	780	2	—
		South-Eastern.			
Total 1898-9	451	24,000	1,098	5	—
Total 1897-8	439	18,160	1,600	6	—
		Western.			
Total 1898-9	33	200	61	1	1
Total 1897-8	37	—	—	34	—
Grand total 1898-9 ..	19,159	1,080,772	128,608	6,190	1,133
Grand total 1897-8 ..	16,761	1,283,094	176,950	4,168	867

The total number of vines in bearing was 8,814,086 as compared with 8,021,070 in 1897-8, while the vines not in bearing numbered 1,355,014, as against 1,803,367.

HORTICULTURAL STATISTICS.

	Almonds.	Oranges.	Lemons.	Olives.	Wattle Bark.
	No	No.	No.	No.	Tons.
		Central.			
Total 1898-9	96,078	87,425	37,807	45,053	6,894
Total 1897-8	108,823	86,381	36,156	40,994	5,553
		Lower North.			
Total 1898-9	20,130	13,048	21,776	9,532	146
Total 1897-8	15,378	11,239	13,975	7,868	140
		Upper North.			
Total 1898-9	8,481	5,357	2,813	293	3
Total 1897-8	7,309	6,225	3,219	223	20
		South-Eastern.			
Total 1898-9	8,650	730	1,190	1,014	1,162
Total 1897-8	4,650	662	702	1,351	1,117
		Western.			
Total 1898-9	562	114	68	1,145	12
Total 1897-8	674	105	72	1,388	—
Grand total 1898-9 ..	130,801	106,674	63,654	57,337	8,217
Grand total 1897-8 ..	136,834	104,612	54,124	51,824	6,830

The produce of last season was 1,325cwts. of almonds, 27,520 cases of oranges, 6,830 cases of lemons, and 3,180galls. of oil. There were 14,081 hives of bees, the produce being 886,084lbs. of honey, as against 155,665lbs. in 1897-8.

AGRICULTURAL AND LIVE STOCK STATISTICS—*continued.*

Quantity of Green Forage.

	Wheat, Oats, or Barley.	Lucern	Sown Grasses.	Silos.	
	Acres.	Acres.	Acres.	No.	Cub. ft.
Central.					
Total 1898-9	777	4,245	901	87	106,274
Total 1897-8	567	4,108	832	98	102,710
Lower North.					
Total 1898-9	118	3,953	310	5	4,040
Total 1897-8	60	2,633	307	1	1,400
Upper North.					
Total 1898-9	—	197	—	—	—
Total 1897-8	—	439	—	2	2,680
South-Eastern.					
Total 1898-9	357	480	19,735	17	8,182
Total 1897-8	639	252	18,944	4	2,300
Western.					
Total 1898-9	—	24	—	2	2,280
Total 1897-8	—	20	—	4	2,968
Grand total 1898-9	1,252	8,899	20,946	111	120,776
Grand total 1897-8	1,266	7,452	20,083	109	112,058

Peas, Potatoes, and Hay Crops.

	Peas.		Potatoes.		Hay.	
	Acres.	Total Produce.	Acres.	Total Produce.	Acres.	Total Produce.
		Bush.		Tons		Tons
Central.						
Total 1898-9................	3,316	49,175	1,757	5,960	167,295	157,016
Total 1897-8................	2,778	30,505	1,562	4,355	247,501	179,167
Lower North.						
Total 1898-9................	—	—	—	—	90,352	60,927
Total 1897-8................	62	280	—	—	138,492	77,853
Upper North.						
Total 1898-9................	—	—	10	12	39,220	22,547
Total 1897-8................	—	—	25	20	41,201	20,126
South-Eastern.						
Total 1898-9................	175	1,976	4,868	8,458	12,112	13,842
Total 1897-8................	77	1,151	4,824	4,895	15,531	17,310
Western.						
Total 1898-9......	—	—	18	15	7,434	4,186
Total 1897-8................	—	—	38	38	6,442	3,728
Grand total 1898-9	3,491	51,151	6,653	14,445	316,413	258,518
Grand total 1897-8	2,917	31,936	6,419	9,308	449,167	298,184

In addition to the crops included in this and the previous tables, there were 2,002 acres under other crops last season and 734,610 acres in fallow. The area under gardens, exclusive of vineyards, was 7,994 acres, the orchards totalling 14,396 acres.

AGRICULTURAL AND LIVE STOCK STATISTICS—*continued.*

STATISTICS OF STOCK.

Central Division.—48,418 working and 13,442 other horses, 40,483 milch cows and 31,381 other horned cattle, 872,715 sheep and lambs, 2,269 goats, 32,444 pigs, 166 other stock, and 607,914 poultry.

Lower North.—27,290 working and 8,834 other horses, 14,729 milch cows and 19,716 other cattle, 978,926 sheep and lambs, 627 goats, 13,118 pigs, 20 other stock, and 206,292 poultry.

Upper North.—20,320 working and 6,446 other horses, 9,996 milch cows and 16,768 other cattle, 475,569 sheep, 898 goats, 8,124 pigs, 604 other stock, and 102,130 poultry.

South-Eastern.—9,452 working and 8,453 other horses, 9,398 milch cows and 26,751 other cattle, 1,334,500 sheep and lambs, 109 goats, 4,833 pigs, 120 other stock, and 63,084 poultry.

Western.—5,172 working and 2,021 other horses, 1,453 milch cows and 3,645 other cattle, 341,105 sheep and lambs, 329 goats, 1,289 pigs, 20 other stock, and 21,582 poultry.

Outside Districts.—5,421 working and 6,505 other horses, 650 milch cows and 85,913 other cattle, 1,009,805 sheep and lambs, 2,322 goats, 324 pigs, 1,722 other stock, and 3,678 poultry.

Gross Totals.—116,073 working and 45,701 other horses, 76,709 milch cows and 183,634 other cattle, 5,012,620 sheep and lambs, 6,554 goats, 60,132 pigs, 2,652 other stock, and 1,004,680 poultry.

BUTTER AND CHEESE.

	Butter.	Cheese.
	lbs.	lbs.
Central.		
Total 1898-9	3,173,785	466,445
Total 1897-8	2,942,870	479,275
Lower North.		
Total 1898-9	627,292	1,315
Total 1897-8	361,220	—
Upper North.		
Total 1898-9	349,224	10,073
Total 1897-8	205,112	1,220
South-Eastern.		
Total 1898-9	392,115	445,290
Total 1897-8	381,486	369,350
Western.		
Total 1898-9	16,267	—
Total 1897-8	8,930	—
Outside Districts.		
Total 1898-9	1,000	—
Total 1897-8	500	—
Grand total 1898-9	4,559,683	923,123
Grand total 1897-8	3,900,118	849,845

PRODUCE EXPORT DEPARTMENT.

By the Manager.

Rabbits.—The season for 1899 has now closed, and the total export for the year amounts to 16,429 crates, containing 407,092 rabbits. The *Narrung*, sailing on the 3rd September, will take the last consignment. The high prices ruling for skins have been somewhat against the large supplies coming forward for freezing that were anticipated, but the figures show an increase of 72,389 rabbits on the number exported last season.

Hares.—With the rabbits small lots of hares have sometimes been received, and one exporter shipped in the *Warrigal* eight crates, containing 128, for which there is a fair market in London.

Butter.—The season has now fairly started, and the shipments for the month have been :—August 10th, *Austral*, 7 tons 10cwts.; August 24th, *Omrah* 12 tons 5cwts.; total 19¾ tons. However, with the continuous dry weather, the opening prospects of a good export season are diminishing, and it is feared, should rain hold off much longer, shipments will fall considerably short of expectations.

Oranges.—The department have made another shipment of 175 cases in the *Austral*, and as every care was taken in selecting, packing, and shipping the fruit, good returns are confidently expected.

Wine.—The shipments from the depôt for the month have been :—*Austral*, 32hhds, containing 1,984galls.; *Omrah*, 40hhds., containing 2,500galls., or 4,484galls. in all; and the sales of 13,979galls., as follows, have come to hand from the London depôt:—Dry Red, 2,282galls. at 2s., 127galls. at 2s. 4d., 4,508galls. at 2s. 6d. to 2s. 9d., 60galls. at 3s., 3,246galls. at 3s. 3d. to 3s. 6d., 1,048galls. at 4s.; Hock, 963galls. at 2s. 4d., 117galls. at 3s. 9d.; Claret, 333galls. at 2s. 6d.; Burgundy, 314galls. at 2s. 6d.; Port, 299galls. at 4s.; Riesling, 651galls. at 3s. 6d.; Muscadine, 31galls. at 5s.

Lambs.—The season's first shipment of lambs was made in the *Warrigal*, which took 478 carcasses. There are now in the depôt 1,565 carcasses lambs awaiting shipment, and the Department has booked dates for receiving consignments during the coming fortnight. The lambs received during the month have been in the main very light, averaging from 30lbs. to 35lbs., due no doubt to the very dry and cold July, which materially retarded the good progress lambs were making.

Apples.—As all the returns for apples shipped to the London market have been received, it will no doubt be interesting to know the net prices realised, and how these prices compare with the previous year's shipments. The department shipped about 2,240 cases this season, compared with 1,000 the previous year. Though the range of prices was not so high as last year's, yet, excepting the *Narrung* shipment, which unfortunately was damaged by being carried at too great a temperature, the net returns were remunerative. Three hundred and forty cases shipped by the *Cuzco*, sailing February 22nd, averaging 16s. 5d., net 10s. 4d.; and 150 cases at 18s., net 11s. 11d.—the highest price for the season—the charges amounting to 6s. 1d. and 6s.; 565 cases sent by the *Omrah* on April 6th ranged from 6s. 3d. to 9s. 6d. net; 10 cases of quinces shipped by the department as an experiment making 3s. 10d. net, a satisfactory return compared with Adelaide value; 175 cases apples sent by the *India* and *Austral* making from 10s. 10d. to 13s. 7d., the net return from the two parcels being 6s. 1d. to 6s. 4d. The largest shipment, unfortunately, was made by the *Narrung*, but owing to damage on the voyage, prices were much reduced; the highest net price was 4s. 11d. and the lowest 1s. 9d., excepting one small parcel of inferior quality which hardly covered expenses, and which was not passed by the Government expert. Mr. Young reported the grading and packing in nearly all cases as excellent, materially assisting in the selling of the fruit; and no doubt the prices realised compare favorably with those shipped by private firms. A grower who shipped ninety cases through the department by the *Narrung* and received 2s. 10d. a case net, states that he sent 100 cases by the same vessel through an Adelaide firm, with the result that not only did he lose the full value of his apples, but a claim for a considerable amount has been made against him, and naturally he appreciates State assistance in connection with this transaction.

Turpentine smeared on the hands, face, or exposed flesh will keep mosquitoes from attacking those parts. This is cheaper than lavender oil, but not quite so pleasant.

FARM HINTS FOR SEPTEMBER.

By the Editor.

Grow a few sunflowers for feeding poultry and fattening cows and horses. Given in moderation the seeds are very nourishing, and give glossy hair and feathers to the animals, birds included. The leaves are much liked by horses and cattle. Sow seeds in September. Throw out deep furrows 3ft. apart; lay in 2in. to 3in. of old manure, tread it down lightly, then cover with 2in. of pulverised soil, sow seeds at least 1ft. apart on the soil, and cover 1in. deep.

The question of top-dressing with superphosphate is one well worthy of experiment. In some cases, perhaps, a very light dressing with sulphate of ammonia might be beneficial. If the crop is short and backward, and the soil caked down, it would most probably help greatly to run light harrows over it.

Directly danger from ground frosts is over lucern may be sown, but the land should be ready beforehand. It should be deeply ploughed, thoroughly pulverised, and made as level as is possible. The subsoil should not be turned up on the surface. It is the best way to sow 10lbs. of seed thinly in drills 1ft. apart and not more than 1in. deep, and lightly roll at once. If sown broadcast and harrowed in, at least 18lbs. of seed would be required. When the plants are 2in. high lightly harrow the ground.

Swedes and kohlrabi should be sown early during this month in drills 2ft. apart, and thin the plants in the rows to 1ft. apart. Plenty of thoroughly well decayed manure may be given. A dressing with 500lbs. per acre of a fertiliser containing water-soluble phosphoric acid 8 per cent.; potash, 8 per cent.; and nitrogen, 2½ per cent., will be very beneficial. Keep the surface loose, and destroy all weeds.

Rape should be sown on deep, rich, light soils by preference, but it has often produced fair crops when sown upon ordinary wheat paddocks without any manure being applied. It is a nitrogen renovater of the soil, and is much liked by sheep and other stock. Three pounds of seed drilled is enough for an acre. The dwarf Essex is considered best. Sow now.

Mustard grows rapidly, and the white variety should be sown now in drills. One peck of seed per acre is ample if sown broadcast, and much less if drilled. This also is excellent feed for sheep.

All root crops and all summer growing crops should be sown in drills, so that the spaces between can be frequently hoed. Beets, carrots, mangolds, parsnips, potatoes, swedes, and kohlrabi, all need regular hoeing.

Ensilage is a necessity for cows where the natural feed is dried up during summer. It also keeps all farm stock in a healthy condition. Fowls lay better when fed partly upon chaffed silage, cows give more and richer milk, and all animals put on a sleek coat when they are fed with a portion of silage every day. Pit silage is undoubtedly the best for cows in milk, and is most probably best under all circumstances. Pits are also more economical, and when the silage is properly treated it will keep good for two or three years. Pits should be about 10ft. wide, 14ft deep, and as long as may be necessary. Tread down compactly around the edges; chaff the silage if possible. Cut the crop during the first half of the day; cart it in during the afternoon and get it into the pit; let it stand till next afternoon, by which time the temperature should have risen to about 130° F. or 140° F.; then put on more silage, which will exclude the air and prevent a further rise of temperature in the lower stratum. When the pit is well filled, cover with planks and put on about 2cwt. pressure for each square foot of surface. Anything that stock will eat can be made into silage; but the good or bad quality of the fodder is regulated by the nutritive value of the plants of which it is composed. Peas, vetches, and other legumes mixed with cereal plants make excellent silage.

About the end of this month sow maize, all varieties of sorghum, holcus, and millets. Maize and sorghums, &c., should be in drills 3ft. apart, and 1ft. between the plants, so that the horse-hoe can be worked frequently to a depth of 2in. Roll after sowing, and hoe directly the plants are up.

It will pay well to use some of the fallowed land for the cultivation of summer fodder crops, even if the same land when sown with wheat next season fails to give as good average as that which was not devoted to sorghum, maize, and other summer crops. If it is possible, such land should be enriched with nitrogenous fertilisers—farmyard by preference; or, failing that, a moderate quantity of sulphate of ammonia or nitrate of soda.

Sunflowers may be sown rather thickly, to serve for fodder to be eaten off the field, as the stems are then small, but it is more economical to cut the fodder and carry it in for the stock A much larger quantity can be obtained by sowing in drills 3ft. apart, thinned to 1ft. between the plants, and frequently cultivated. If a good quantity of kainit had been applied ten weeks ago the crop would benefit considerably. If this has not been done it would be well to top dress and hoe in a little crushed nitrate of soda and some superphosphate.

In the cooler and moister climate of the hilly country and South-East sow white clover, and other clovers, trefoils, medics, cocksfoot, rye-grasses, fescues, poas, and Brome grasses. Main crops of field peas are also sown at this time by some farmers in the South-East. Two to three bushels of seed drilled is sufficient for one acre. A bushel weighs 63lbs. to 65lbs. Lime is required for this crop, and a calcareous loam or sandy or gravelly soil recently limed will suit. Drills 2ft. to 3ft. apart.

Chicory requires the same soils and treatment as carrots and parsnips, and all can be sown now in localities where the soil is deep, loamy, moist, and in fairly good heart, and where the weather is not too hot and dry. The hilly districts and South-East fulfil these latter conditions. Three pounds of seed will sow an acre.

Hay harvest will be early this season, and appearances indicate that the average crop will be very light, though in some localities there may be fair yields. It should be cut and stacked before the plants have become dry, woody, and straw-like. Probably the best time to cut is directly after flowering, before the sap gets out of the stems, and the hay should be stacked directly it is dry enough, because it bleaches and spoils by too long exposure to light and air.

Make every possible provision against fire, not only by cutting a space clear around the crops; but also for fighting the fire, should one occur on your own or your neighbor's holdings.

Carrot seeds should be rubbed between the hands with sand, to remove the hooked spines. Three pounds of carrot or parsnip seed will sow an acre, if drilled. Drills should be 18in. apart, and thinned to 10in. between the plants. Sow a very few radish seed in the drills, to mark the lines, and directly the carrots, or parsnips, or chicory show up, begin to hoe the surface to a depth of not more than 2in. between the rows.

Directly danger of ground frosts is over, plant out tobacco in rows 2ft. by 2ft. Use a little nitrate of potash, or, if the land is rich, use sulphate of potash. Constant watchfulness must be maintained for the caterpillars, and every plant must be searched daily for them.

Poor, sandy, gravelly, and stony land can be covered with buckwheat, sown in drills 18in. apart. A bushel of seed (50lbs.) is enough to drill one acre, or 3bush. broadcast. Crop will be ready in eight to ten weeks. It is good fodder for cows, the seeds are much liked by poultry and all birds, and the flowers give a deal of good honey for bees.

Put in some rows of peanuts on light calcareous soils, in drills 2ft. apart, and thinned to 14in. or 18in. in the rows.

POULTRY NOTES.

By D. F. Laurie.

Duck Breeding.

The Secretary of the Dowlingville Branch wrote me last month *re* duck breeding, but the request came too late to admit of a reply in the August number of this journal. As regards housing, large sheds, or old barns may easily be fitted up to accommodate considerable numbers. Ducklings are soon affected by heat, and under such conditions do not thrive. Suitable sheds can be made at small cost of timber, slabs, or even thatch—either straw or seaweed—according to the locality, will answer. Ample provision of straw (dry grass is excellent) is necessary; this must be kept sweet and dry. The ducklings may be kept in small enclosures, the different flocks being separated by planks eighteen inches in height, and movable. The first week or so is the critical period, during which extra attention is necessary, if the nights are cold. To be successful in duck rearing, it is necessary in the first case to breed from first-class stock. You want healthy vigorous parent birds of large size, so as to obtain large, strong ducklings capable of rapidly putting on flesh to fit them for market at an early date, say from eight and a half to ten weeks old, otherwise the profits of the venture will vanish.

Every day, beyond the proper time, that a flock of ducklings is on hand means a proportionate unnecessary outlay and consequent loss. For the export trade it is of the greatest importance that ducklings should be kept growing without the slightest check from hatching till killing. I read recently that the English buyers considered a shipment of South Australian ducklings ten days too old; the writer of the article, who was also the shipper, demurred to this expression of opinion as a flimsy excuse. Now, I did not see the birds, so cannot say if there were other defects, but can confidently assert that a difference of ten days would mean a great deal, not only as regards cost of production, but also as constituting a prime duckling, from an English point of view. The honest fact of the matter is this, our breeders and shippers do not know what a prime duckling is from the English poulterer's point of view. I think it would be well worth the trouble and small outlay, if Messrs. C. E. Brooke & Co., of Leadenhall Street, London, were commissioned to send out a pair each of prime chicks, ducklings, a goose, and a turkey, so that occular demonstration might be afforded. Such a collection could be kept for a long time at the depôt, and could be exhibited at several of the principal shows. Our South Australian ducklings realised 2s. 6d. each in London, a truly wretched price. We have several things to contend against; firstly, while the air is ringing with comments on Australian and Imperial Federation, the Australian producer is classed with the Russian, &c., as a "foreigner"—hence we encounter prejudice. Then we have the scruples of the trade to overcome. Poultry shipped to England nets a less price than if sold locally. Yet on the other hand we find that one of the leading firms of poulterers in London have a representative in Sydney. Who pays the piper?

I have now before me some valuable information, for which I am indebted to the courtesy of Mr. J. W. Stephenson, secretary of the Board of Exports, Sydney.

> The ducklings we shipped were mostly Aylesbury and Pekin, and averaged about ten weeks old, average weight about 4¾lbs., with a minimum limit of 4lbs. The prices realised range from 2s. 9d. to 4s. each, and would average for the season about 3s. 3d. I have not yet made up the charges, but think they will run well under 2s. per pair. The fowls we shipped brought from 3s. to 4s. each, average about 3s. 6d. They were chiefly Orpingtons, Game, and Orpington-Game; age average, eighteen weeks; weight average, 3½lbs. The only secret of success lies in growing the birds right on from hatching, and carefully grading, anything not prime being rejected.

This bears out exactly what I have for many years asserted. I maintain that under existing circumstances it is barely possible for an individual small shipper to send a crate even of properly graded birds. The Victorian Department did a good stroke when they purchased and shipped poultry; the high prices they realised were no doubt in chief part due to careful grading. I have also before me a pamphlet, "Resumé of Operations, seasons 1897-8-9" N.S.W. Board of Exports. I will quote a line or two which I believe is applicable to our S.A. depôt.

> Here it may be mentioned that everything done on behalf of producers at the Government Export Depôt has to be paid for at commercial rates, so that no undue advantages are given to exporters at the expense of the general taxpayer.

One of the greatest ultimate blessings to this colony will be the opening up of a good market in frozen poultry and eggs. There is an unlimited demand in England at the precise time of year when our produce can arrive, provided only that it is in accordance with demand; we must not attempt to dictate to the purchaser. Mr. Stephenson advises me that a recent shipment of ducklings realised, according to a cable, the sum of 8s. per pair; if so, a certain and profitable market is assured. Now, if New South Wales ducklings realised 8s. per pair, why do South Australian ducklings only bring 5s. per pair? Answer—" Quality and condition not right."

Before closing the matter of duck breeding, I should like to urge upon the owners of butter factories and creameries the claims to recognition of a very promising field of enterprise. The Aylesbury (England) system commends itself. The ducklings should be hatched at a central establishment, and parcelled out to clients and others for rearing. The final fattening and grading should be done at the factory. It must be borne in mind that waterfowl lose weight on a railway journey; therefore every necessary detail must be arranged before consigning to the depôt, so that there shall not be one hour's delay. Chickens are not so susceptible. I notice that in Sydney the egg packers make a free use of the cold storage chambers—the charge is 1d. per gross per week. Eggs keep excellently in this manner, which is by no means unknown in Adelaide.

THE USE OF MILK IN THE MANUFACTURE OF BREAD AND CONFECTIONERY.

Perhaps one of the most striking contributions to the current Journal of the British Dairy Farmers' Association is that by Mr. William Smith, of Edinburgh.

Ten years ago, says this authority, when the creamery system in Great Britain was just in its infancy and the question of dealing with large quantities of separated milk was staring us in the face, I had the privilege of bringing the use of separated milk in bread-making before a meeting of the members of the British Dairy Farmers' Association, and of exhibiting samples. Shortly after this the Association introduced milk bread as a section in their prize list at their annual Dairy Show in London, which has been continued with growing interest ever since, and the effect has been to increase the consumption of milk in baking generally, and especially separated milk in biscuit baking, and wherever it has been introduced there has been a great improvement in the quality and an increase in the sales and a greater variety produced. The loaf bread trade is slower to move in the use of separated milk. This arises from the fact that milk is more difficult to use with barm or yeast than water, yet we feel confident that the additional weight obtained, richer quality, and finer appearance of the bread, will more than pay for the value of the milk and the additional care required.

Taking a sack of good flour weighing 280lbs., it will take 175lbs. of water to make a consistent dough for loaf bread, or a gross weight of 455lbs., yielding when baked 96 loaves of 4lbs. each, showing an evaporation of 71lbs. on the sack; 280lbs. of flour will take 210lbs. of milk, making a gross of 490lbs., yielding 110 loaves of 4lbs. each, showing an evaporation of 50lbs. on the sack. The cost of separated milk would be 6s. 10d. The value of the 14 additional loaves, at 5½d. each, would be 6s. 5d., and 96 loaves at ½d. each of additional value over the water bread is 4s., making 10s. 5d., from which we deduct 6s. 10d. for milk, leaving a profit of 3s. 7d. per sack in favor of the milk loaves, that is taking the additional value at only ½d. per 4lb. loaf, which is a very low estimate.

Bread made with separated milk is shown to be superior to the ordinary water bread, and, of course, bread made with pure milk would be very much superior, being richer in fat, but the extra cost of pure milk could not be recovered in the extra price of the bread, whereas the additional outcome in the weight and extra value of the separated milk loaf bread more than pays for the price of the separated milk.

Separated milk loaves can also be sold as fancy bread, and do not require to be weighed to the statutory weight of 4lbs., and consequently a larger profit can be made. A very common bread with all classes of society in Scotland is the girdle scone; many dairymen have lately added the baking of these scones to their business and find it more profitable than the milk trade, while at the same time it provides a ready market for their separated and butter milk. The labor required in baking these scones is very small. A hot plate, 3ft. long by 2ft. broad, with gas, will keep a man or woman firing as fast as another can put them out. The best class of flour for baking scones is a flour of good color, and that will drink its own weight in milk, say, 10lbs. of flour will consume 10lbs. of sour, skim, or butter milk, the evaporation of baking in this way is practically nil, and you have 20lbs. of first-class bread for 1s. 8d., or 1d. per lb. at present prices.

The more milk the flour drinks the better the scones, and the more the profit to the baker, as the milk is less than half the price of the flour and yields the same output. A special feature in the quality of these scones, however, is the souring of the milk. Many people seem to think that any kind of milk will suit, and that where the proper sourness has not been attained, it can be made up by an additional quantity of tartaric acid. This is a mistake, even although the defect were made up in this way, which it is not; the additional cost of tartaric acid is more than a working profit, and the goods want the fine flavor and glossy appearance of scones made from milk coagulated and containing the full quantity of lactic acid.

Dairymen and creamery managers would find it to their advantage to give more attention to the preparation of separated milk for the baking of scones and small bread—that is, how to sour separated milk so as to make it equally suitable and valuable with butter milk.

In the north of Ireland and south and west of Scotland many farmers carry on what is known as "The Butter and Sour Milk Trade"—that is, the milk is set straight from the cow in large dishes and allowed to remain until the whole quantity is coagulated with lactic acid, and when fully ripe showing a fine velvety appearance on the top, with a decided lactic flavor, when the whole quantity is churned, and the butter taken out, the whole of the by-product being butter milk, and this is the kind of milk run on by bakers as superior to any other kind. Now, there is no reason why the separated milk should not be made to serve the same purpose. In the case of the whole milk, the lactic acid is developed under the most favorable circumstances. The milk is cooled from the cow in order to prevent too rapid a development, and care is taken that the acid does not over-reach its maximum and produce rancidity, and at the same time the error of ripening too slowly and producing bitterness has to be avoided in order to produce good butter, and the result is good butter and good butter milk at the same time. Now, if those who handle separated milk for baking purposes would cool it down from separating temperature to 65degs. and add a starter of lactic ferment, set it aside undisturbed in a dry even temperature, say about 60degs., the whole body of the milk will be ready for churning in 48 hours. Ten minutes churning will be sufficient to break up the coagulation ; care should be taken that this class of milk is not subjected to any process of heating after being churned, otherwise decomposition will at once set in, and the milk become unfit for baking.

Butter milk from cream or whole milk, will contain a percentage of butter fat, that is not to be found in separated milk. On the one hand, the dairyman is the loser by selling his butter in the butter milk, and on the other, the baker can add a cheaper fat and serve his purpose equally as well with ripened (soured) separated milk. We feel confident that if the ripening of separated milk were more scientifically attended to, that millions of gallons more would be required yearly in Great Britain for baking purposes than there is at present.

Biscuit factories are now fully alive to the value of separated milk, nothing cheaper can be found to enhance the quality and value of their goods. Those firms who have been hanging back and grudging the cost of the milk and baking with water, have almost lost their trade. Take such firms as McVitie and Price, in Edinburgh. Their milk receiving department is like a huge creamery, and the demand for their biscuits and cakes all over the world is something marvellous.

In the making of ice cream separated milk is very useful when taken straight from the separator.

In the baking of cakes more milk and fewer eggs is now the rule. Cakes that used to be made with a mixing of 24 eggs and no milk are now made with 16 eggs and a quart of milk, producing a cheaper and richer cake.

French scalded pastry, Russian toffies, and the finest confections where liquid can be used in their manufacture are much improved with milk. French, German, and Italian pastry, cherry, fig, and Genoa cakes can all be made with milk.

The future extension of the use of milk, and especially separated milk, in the baking and confectionery trades, largely depends on the creamery managers presenting it in a condition suitable for the trade. Those who use it with barm or yeast must have it perfectly free from lactic acid, and this requires care in separating, scalding, refrigerating, and delivery. Those who use it as sour milk must have it ripened under the most favorable circumstances, free from rancidity or bitterness, or any mixture of water or collection of old milks that have been souring under different conditions for days, and, in several cases, a week.

The producer of all kinds of food stuffs endeavours to provide the very best article for his customer, thereby stimulating and extending his own trade, and so with the milk; there is an unlimited outlet for cream and milk in the baking trade, and the milkmen have this extension largely in their own hands, by keeping in touch with the bakery trade and providing exactly what they require, and also pushing the sale of ripened skimmed milk into private families who bake their own bread.—*The Dairy.*

Phosphoric acid is contained in some kinds of iron slags, some kinds of rocks, in bones and products from bones, and in most clays and in coprolites. Nearly all, if not all, guanos contain a large percentage of phosphoric acid. In nearly all cases phosphoric acid is in combination with lime, and the more lime the less soluble is the combination.

MONTHLY RAINFALL.

The following table shows the rainfall for August: —

Adelaide	1·59
Wilson	0·97
Quorn	1·05
Port Germein	0·60
Port Pirie	0·64
Crystal Brook	0·57
Port Broughton	0·45
Hammond	0·45
Bruce	0·19
Melrose	1·29
Wirrabara	1·11
Appila	0·59
Laura	0·94
Caltowie	0·73
Jamestown	0·97
Gladstone	0·52
Georgetown	0·86
Narridy	0·73
Redhill	0·70
Koolunga	0·53
Carrieton	0·73
Eurelia	0·85
Black Rock	0·46
Petersburg	0·58
Yongala	0·56
Terowie	0·53
Yarcowie	0·53
Hallett	1·16
Burra	1·29
Snowtown	0·72
Brinkworth	0·72
Blyth	1·33
Clare	2·17
Mintaro Central	1·18
Watervale	2·45
Auburn	1·64
Manoora	1·22
Hoyleton	1·48
Balaklava	1·38
Port Wakefield	0 33
Saddleworth	1·39
Marrabel	1·28
Riverton	1·19
Tarlee	1·11
Stockport	1·20
Hamley Bridge	1·08
Kapunda	1·21
Freeling	1·28
Stockwell	0·89
Nuriootpa	1·11
Angaston	0·82
Tanunda	1·10
Lyndoch	1·28
Mallala	0·87
Roseworthy	1·18
Gawler	1·11
Smithfield	1·00
Two Wells	1·29
Virginia	1·31
Salisbury	1·27
Teatree Gully	2·06
Magill	2·17
Crafers	3·44
Clarendon	3·00
Morphett Vale	1·52
Noarlunga	1·18
Willunga	1·16
Aldinga	1·34
Normanville	1·39
Yankalilla	1·75
Eudunda	0·99
Truro	0·75
Mount Pleasant	1·50
Blumberg	1·78
Gumeracha	2·00
Lobethal	2·52
Woodside	2·25
Hahndorf	2·41
Nairne	2·14
Mount Barker	2·58
Echunga	2·34
Macclesfield	2·52
Meadows	2·89
Strathalbyn	1·46
Callington	1·22
Langhorne's Bridge	1·17
Milang	1·26
Wallaroo	0·78
Kadina	0·81
Moonta	0·79
Green's Plains	0·88
Maitland	1·08
Ardrossan	0·33
Port Victoria	0·76
Curramulka	1·49
Minlaton	1·77
Stansbury	1·13
Warooka	1·09
Yorketown	0·86
Edithburgh	0·69
Fowler's Bay	1·22
Streaky Bay	0·87
Port Elliston	1·14
Port Lincoln	1·80
Cowell	1·64
Queenscliffe	1·21
Port Elliot	1·31
Goolwa	0·90
Meningie	0·88
Kingston	0·85
Robe	0·53
Beachport	0·86
Bordertown	0·48
Wolseley	0·52
Frances	0·74
Naracoorte	0·92
Lucindale	0·83
Penola	1·04
Millicent	1·32
Mount Gambier	1·35
Wellington	0·72
Murray Bridge	1·13
Mannum	0·96
Morgan	0·58
Overland Corner	0·39
Renmark	0·27

WEATHER AND CROP REPORTS.

Balaklava.—Nice soaking rains, from ¾in. to 1¼in., fell early in the month, freshening up all vegetation; but since, the weather has again been very dry and a good downpour is needed. A wet September would make a great difference to the farmers, feed and crops being backward, and little water has run into the dams. Grubs are reported to be plentiful in some grass paddocks.

Baroota Whim.—Rain is badly wanted, the frosts and drying winds having had a bad effect on the crops and feed. Fallowing is at a standstill.

Booleroo South.—Nearly ¾in. of rain fell early in the month and the wheat has made fair progress; rain is again needed, however. Fallowing is being pushed on, and in some cases has been completed. The wool clip promises to be good, as does the lambing.

Bordertown. – The weather has bas been very dry again; grass is sparse, and the crops need more moisture. Even in the most favorable locations very few dams are full. The crops are looking strong, but will suffer severely unless we get rain soon. A large area has been put in in this district with the seed and fertiliser drills. Lambing promises to be very good.

Bowhill.—Dry weather and frosts have had an injurious effect on the crops, some paddocks becoming quite brown. They are, however, improving as a consequence of the rains early in the month. Some paddocks are coming into ear though fed down by stock. The advantage of putting the crop in with the seed and fertiliser drill is very evident.

Burra (West Side).—A little over an inch of rain fell early in the month, but since then it has been very dry and cold. Crops and grass are looking fairly well; but the land is dry for fallowing. A good soaking rain to penetrate the subsoil is needed.

Dawson.—The season is again very discouraging; rainfall for July being practically nil, and August, to date (21st) only 20 points registered. Wheat is patchy; grass very scarce. Stock feeding on herbage.

Elbow Hill.—Since the rain at beginning of month the crops have made wonderful progress. Stock in good condition. More rain required. Rainfall to date, 1·60in.

Eudunda.—The weather is very dry and cold, the frosts proving greatly detrimental to growing crops. A poor harvest expected through want of rain.

Inkerman.—Weather cold and dry. Expectations of a poor hay crop. With rain within a few days a good wheat yield may be reaped.

Johnsburg.—Three weeks' severe frost in July checked both crops and feed, but the nice soaking showers early in August caused a marked improvement in the appearance of the paddocks. Stock will now be able to obtain fair feed. Fallowing is being pushed on. With a wet September a fair harvest will result.

Kapunda.—Wheat crops have made very little growth during past month. Feed is short, but stock look fairly well. A good soaking rain would cause a wonderful improvement.

Minlaton.—The soaking rains early in the month were of great benefit. Frost has not been so prevalent since, but more rain is anxiously looked for. The benefit of fallowing is very evident in the appearance of the crops, and this practice is the order of the day. Feed is not plentiful, but farmers have sufficient hay, &c., for requirements. Stock are in fair condition. Crops strong and healthy. No complaints of damage from takeall or underground grubs.

Morgan.—Some of the crops promise to give a good return, but others again are very poor.

Mount Compass.—Rainfall for three weeks, 2·62in.; total to date, 23·74in. Cattle look well considering the cold weather.

Mount Remarkable.—During the month the weather has been cold and dry. Crops look healthy, but need rain, especially on the plains. Feed is very backward, but growing fairly well.

Nantawarra.—The cold weather experienced here has impeded the growth of feed, and consequently stock are very poor. Rainfall for month to date, 0·57in.; total for year, 6·25in.

Pine Forest.—Over ¾in. of rain fell during the first week of Augnst, which did a vast amount of good, but more is needed. Early wheat is looking well. Feed fairly plentiful. Stock looking well.

Riverton.—The crops are looking nice and healthy, especially those drilled with fertilisers. The cold weather in July caused the majority of crops to stool out well. Rain wanted soon. Rainfall for August, to 19th, 1·39in.

Saddleworth.—The effect of the continuous frosts is seen now in very backward feed. The wheat on the fallow is growing well, but late-sown crops are thin and short. Stock, particularly sheep, are feeling the shortness of grass. Rainfall—Only half the amount of last year to date.

Watervale.—The feed and crops have improved a little since the last rain, but more is badly needed.

Yorketown.—The weather keeps very dry. Rain badly wanted.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— August 31, 1899.

August opened somewhat favorably after the long dry spell in July, but, although general rains were experienced, the fall was light, as our farmer friends said "simply enough to go on with," since which the weather has been again dry, with cold winds, so that crops and pastures everywhere are suffering, and it is felt that unless we have good rains very shortly the chances for the wheat crop in the earlier districts will be very poor, and, taken altogether, the agricultural outlook is far from bright. The continued frosts played further havoc with early potatoes and other vegetables, so that we are dependent upon importations for a large proportion of our requirements in these.

In commercial matters the position is hardly so satisfactory, with the gloomier prospects in country districts, but the continued extension in other directions, and the success that is being met with in the search for copper and other ores in a measure compensate, so that business generally is brisk, and it is hoped that the wool clip, already beginning to reach market, will realise a substantial improvement on last year's value.

The wheat crop in the Northern Hemisphere is apparently being safely garnered, no appreciable alteration in price throughout the month of August, which is usually a critical one, having occurred, but as authorities do not estimate the season's yield as likely to much more than cover ordinary requirements the probabilities of firm prices ahead seem favorable to speculators, who even at present are not disinclined to operate. Locally there has been but little change. Wheat is, if anything, a shade higher, whilst flour is about 5s. easier; millers' offal, however, has advanced about 1d. Holders of hay are closely watching the weather, values already being about 7s. 6d. per ton higher, and if rain does not fall shortly a further marked advance in this line may be looked for. Feeding grains, although showing only slight improvement in quotations, are more firmly held.

The market has been fed chiefly by imported potatoes, supplies from the South-Eastern district of this colony having to submit to the control of imported values, which have been steadily easing. Local onions are filling our wants, and as stocks are well held price is maintained just below the figure at which imported could be laid down.

There has been a steady increase during the month in the milk yield, so that larger supplies of butter have reached market from week to week, leading to a resumption of the export trade. A little has been shipped for Europe, but intercolonial markets generally are more favorable for disposal. British values are 5s. to 8s. per hundredweight better than at corresponding period of last year, but as large stocks of butter, it is known, are held in cold storage both in Europe and America it is yet doubtful how the market will be by the time Australian shipments begin to arrive freely, although there is no reason at all to expect, at any rate this side of the new year, any lower prices than ruled up to the close of 1898. Local values have come down to and are controlled by export rates. The seasonable fall in value of eggs occurred during the month, and from appearances we have about reached bottom spring rates; price on this market, however, is subject to Melbourne and Sydney quotations owing to the competition from those ports for the trade of our chief customer, West Australia. Prime-conditioned cheese has been in very good demand, although there is difficulty in disposing of the balance from last spring, medium grade being mostly in dry, poor condition. Bacon has had good sale. Fair trade in honey, but price shows slight easing. Beeswax very readily saleable. Almonds scarce.

Full supplies of carcass pork and veal have been coming forward to the weekly sales and price has averaged a shade lower, but demand continues good. Poultry, both dressed and live, has been selling very well with the exception of turkeys, which this season have ruled much below average.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Farmers' lots at Port Adelaide, 2s. 10d. to 2s. 10½d.; outports, 2s 9½d. per bushel of 60lbs.

Flour.—City brands, £6 10s. to £6 15s.; country, £6 to £6 5s. per ton of 2,000lbs.

Bran, 9d.; pollard, 9d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 8d. to 1s. 11d.; good stout white, 2s. 6d. to 2s. 9d. per bushel of 40lbs.

Barley.—Malting, nominal, 2s. 9d. to 3s.; Cape, 2s. to 2s. 3d. per bushel of 50lbs.

Chaff.—£3 5s. to £3 12s. 6d. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Mount Gambiers, £2 15s. to £3; Imported £2 17s. 6d. to £3 5s. per 2,240lbs.

Onions.—£6 15s. to £7 5s. per 2,240lbs.

Butter.—Creamery and factory prints, 8½d. to 9¼d.; dairy and collectors' lines, 6d. to 8d. per pound.

Cheese.—S.A. factory, best, large to loaf, 6d. to 7d.; ordinary to fair 4d. to 5d. per pound.

Bacon.—Factory-cured sides, 6½d. to 7d.; farm lots, 5d. to 6d. per pound.

Hams.—S.A. factory, scarce, 6d. to 8d. per pound.

Eggs.—Loose, 6d.; in casks, f.o.b., 7½d. per dozen.

Lard.—In bladders, 5½d.; tins, 4½d. per pound.

Honey.—2d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.

Almonds.—Soft shells, 4½d. to 5d.; kernels, 1s. 1d. per pound.

Gum.—Best clear wattle, 2d. per pound.

Carcass Meat—Bright shop porkers, 4½d. to 5d. per pound; baconers, 4d. to 4½d.; poor quality and heavy weights, 3d. to 3¾d.; prime vealers, 1½d. to 2d. per pound; poor to medium, ¾d. to 1¼d.

Dressed Poultry—Turkeys, 5½d. to. 6d. per pound; fowls, 4½d. to 5d.

Live Poultry.—Table roosters, 1s. 6d. to 1s. 9d. each; good hens and medium cockerels, 1s. 3d. to 1s. 5d.; ordinary sorts, 1s. to 1s. 2d; ducks, 2s. to 2s. 4d.; geese, 3s. to 3s. 6d.; pigeons, 6d. to 7½d.; turkeys, from 4¼d. to 5¾d. per pound live weight for fair to good table birds.

SANDY SOILS should be sown with buckwheat. This will prevent drifting, and the plant makes excellent forage for cows and other live stock. Buckwheat honey is nice; and the seeds can be ground and mixed with an equal quantity of wheat flour for making buckwheat cakes. The seeds are much liked by poultry of all kinds. Buckwheat begins to bloom soon after the plant is out of the ground, and it matures very soon.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, AUGUST 16, 1899.

Present—Mr. F. E. H. W. Krichauff (Chairman), Hon. A. W. Sandford, M.L C., Messrs. T. Price, M.P., T. B. Robson, and A. Molineux (Secretary)

Congress.

The SECRETARY reported that he had received numerous offers of papers, etc., for discussion at the forthcoming congress, in fact, four times as many as it was possible to accept. A committee was appointed to make a selection of the subjects submitted.

Branch at Wilson.

The formation of a Branch at Wilson, with the following gentlemen as members, was approved: — Messrs. D. McNeil, H. Need, T. Barnes, R. Rowe, A Crossman, H. Crossman, J. H. Gill, T. Matthews, H. Ward, J. Coombes, W. H. Neal, and A. Canning.

An application for approval to the formation of a Branch at Melton could not be granted, the locality being within six miles of Paskeville, where a Branch is already established.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

314. "*Olives*," by F. T. Bioletti, of the University of California, contains a great mass of information, from which I make some extracts. As a native of Southern Europe, it requires a higher temperature than the vine, for young wood is injured even at a somewhat higher temperature than 15° F , and at 10° F. the tree is destroyed. It succeeds best where the mean temperature of the coldest month does not fall below 43° F., and within 100 miles from the sea. The fruit is of poor quality on heavy clay or ill-drained soils, but will grow in rocky soils where nothing else but a vine could succeed. Profitable crops can only be expected in a light loamy soil rich in lime, and certainly not in poor soil The roots penetrate to great depth, and thus the tree withstands great drought; but slight irrigation may in such case be useful. The best heavy-bearing and longest living trees are those grown from seed, but they commence to bear several years later than those raised from cuttings. For sowing, the flesh should be removed from the pitts, and these should be worked, or they will remain two years in the ground before germinating. Another plan is to put the pitts for twenty-four hours in a solution containing ½lb. of caustic soda to 1gall. of water. This softens the shell sufficiently, and the olives are then sown 1in. deep in a heavily-manured bed of thoroughly rotted dung, and well watered until the seedlings appear. In time they must be grafted, at the neck of the roots, or budded. All fruit is borne on two-year-old wood, and new shoots are therefore necessary to regular bearing. Light pruning is good for thinning out wherever branches are too thick, or where branches grow too long, in order to make them send out side shoots for fruiting-wood. Large trees of great age may require cutting back even the largest branches, but this must be done gradually, or the tree may be injured. The large cuts should be covered with pitch. The selected young shoots should be pruned back to force out branches. For green pickles, the olives should be picked soon after obtaining their full size; for ripe pickles, when they contain the maximum of oil, soon after they are well colored, but before the deep black signifies over-ripeness. If too green the oil will be bitter; if too ripe, rancid. The pickled green olives are indigestible and contain little nutriment; they are, in fact, in no way superior to unripe apples or peaches—simply a relish to be used in small quantity. Pickled ripe olives are extremely nutritious and digestible, and replace meat to a certain extent in some countries. The largest olives for pickling are the Picholine, having seventy-seven to a pound; the Sevillano, only 36·2; Polymorpha, 71·9; Macrocarpa, 72·8; Asiolano, 60·6, and Amygdalina, 76·9. Although much smaller, the Mission olive, with 111·6 to the pound, is well suited for pickling, and as it also produces oil of good quality which keeps well, this combination of qualities recommends it to growers. The Mission has 22·51 per cent. of oil in the flesh and only ·61 in the pitt. It is therefore not tainted with the flavor of "pitt-oil." The Manzanillo has 106·6 olives to the pound, 19 73 per cent. of oil in the flesh and only ·55 in the pitt. The Nevadillo Blanco is the first to suffer from frost. It contains two-thirds

more oil than in France, and is twice as large in California, 157·3 make a pound; it has 22·92 per cent. of oil in the flesh, and ·99 per cent. in the pitt. Pendulina needs 157·1 to the pound, gives 21·36 per cent. of oil in the flesh, and ·96 per cent. in the pitt. Rubra wants 196·1 to the pound, gives 22·01 per cent. of oil in the flesh and ·75 in the pitt.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Port Pirie, Mr. T. Johns; Golden Grove, Mr. James Anderson; Amyton, Messrs. R. Brown and William Hughes; Forster, Mr. C. Read; Elbow Hill, Mr. W. A. Crook; Redhill, Mr. Walter Steele; Kadina, Mr. D. F. Kennedy; Wandearah, Mr. J. Wall; Lucindale, Messrs. A. Carmichael and J. Riddoch; Davenport, Messrs. J. Julian, H. J. Driscoll, and G. Hadlow; Forest Range, W. O. Kumnick; Albert, Mr. W. H. Freer, F. Drogemuller, and W. Stutgart; Caltowie, Mr. S. Wenham.

Reports by Branches.

The Secretary reported receipt, since previous meeting, of eighty reports of Branch meetings.

REPORTS BY BRANCHES.

Boothby, July 25.

Present—Messrs. J. T. Wright (Chairman), J. A. Foulds, G. T. Way, J. R. Way, H. G. Evans, R. Carn, T. Robinson, R. Chaplin, J. Bell, E. Bradley, T. Sims, R. M. B. Whyte (Hon. Sec.), and two visitors.

SHELTER BELTS.—Members generally favor sugar gums and pepper trees for shelter belts in this locality. Mr. R. Evans undertook to grow various kinds of forest trees for members and others upon condition that they assist in making the sheds and preparing nursery beds.

TRAVELLERS' TALES.—Mr. J. R. Way described a recent trip he had taken from Broken Hill through New South Wales to Tamworth. The land appeared to be better than in South Australia, but farming is done on a small scale, often with single-furrow ploughs. Although good crops are secured there are serious drawbacks—such as heavy timber and bad roads. He considered a farmer would be better off with light crops in this district.

FARMERS' HOLIDAYS.—Members would like to have excursion tickets granted during February and September, to last over six weeks, to enable farmers with their families to travel to any part of the colony where the railway lines extend.

HOMESTEAD MEETING.—This meeting was held at the farm of Mr. J. Bell, where, after inspecting the crops, implements, sheds, &c., the members were liberally entertained.

Port Lincoln, July 21.

Present—Messrs. W. Laidlaw (Chairman), G. Dorward, J. Telfer, R. Puckridge, J. O'Shanahan, E. Chapman, R. Sullivan, J. D. Bruce, W. E. Goode, J. Anderson (Hon. Sec.), and several visitors.

BAIT FOR WILD DOGS.—Dr. Kinmont strongly recommended asafœtida as a bait for trapping dingoes, and kindly supplied members with a quantity of the drug.

DISC PLOUGH.—Arrangements were made for an exhibition of a disc plough in work on Mr. J. D. Bruce's land.

Kadina, July 6.

Present—Messrs. T. M. Rendell (Chairman), H. Johnson, T. H. Warren, M. Quinn, D. Kennedy, D. Taylor (Hon. Sec.), and one visitor.

TAGOSASTE.—Mr. Kennedy said he had one plant of Cytisus palmensis which had grown up to a large size. Other members reported that seeds germinated, but plants died. Not only had the season been dry for three years, but the ground was also dry.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

ANNUAL REPORT.—The Hon. Secretary read the annual report of work done, and remarked that it would be advantageous to meet sometimes at homesteads, thus imparting a social element into the work of the Branch, and enabling the members to pick up useful hints and probably impart some useful knowledge. Other members concurred.

SHEEP AND SHEEP-KEEPING.—Mr. T. H. Warren read the following paper:—

In compliance with a request, I have endeavored to put into a concise form some of my views upon the sheep-farming industry, with especial reference to farmers' flocks. The subject is a very wide one, and it is difficult to decide where to begin, upon what points to dwell, and what to omit. Matters of the greatest importance in some localities are comparative details in others, and as my experience has been gained on the large sheep stations of the Far North rather than in the smaller and more varied districts of the Lower North and South I shall not be surprised if I am at times at fault. There is no country in the world more adapted for sheep, especially the merino sheep, than Australia, this having proved itself to be the only variety which, in types varying with its surroundings, can be grown profitably in our vast saltbush areas. The first merinos were introduced by the much-abused South Australian Company early in 1836, from Tasmania. The number of sheep in the colony had in the year 1840 increased to 200,160, and in that year the value of the wool exported was £8,740 The number continued to increase by leaps and bounds till it reached 6,120,211 in 1874—more than twice the estimated number in the province at the present day. From 1874 to 1887 was perhaps the best period in the history of sheep-farming in this province; seasons were good and prices were high, and as the numbers of sheep varied but little from 6,800,000 it seemed as though we had reached the limit of the carrying capacity of the country then stocked. The rabbit had not then come to stay with us and work out the almost irretrievable ruin of much good pastoral country. This period was followed by a period of vicissitude which is fast approaching crisis, and the future of a once great industry—if future it has—looms black and gloomy. This has been brought about by a variety of causes, some beyond the control of man; but the one cause above all others which has conduced to it is, I have no hesitation in saying, bad legislation and worse administration, creating a feeling of unrest amongst those who were able and willing to risk their capital in surmounting the difficulties it has pleased nature to place in the way of man in his endeavors to subdue our vast arid interior. For some years past the industry has been hampered by extremely low prices, and this has had a very undoubted and depressing effect on the industry. But I think it has also done its share in improving our flocks. It was found that with inferior sheep the margin of profit had become so small as almost to vanish, and it became necessary to either abandon them or find more profitable sheep. The result was a very rapid improvement in the class of sheep found in our general flocks. There is another cause which assisted in this, and that is the recurrence of severe droughts of late years. This made it necessary to stock more lightly and to make fewer sheep return as much or more money than a larger number returned formerly, and the improvement which is everywhere apparent in the quality of our flocks is a high testimony to the intelligence and perseverence of our flockmasters. The long legged, round-boned, bare-faced, bare-pointed, and sparsely-covered scarecrow which used to meet us almost everywhere is now, in the great majority of our flocks, extinct. To keep our flocks in their present satisfactory condition and to continue the improvement which has been found so profitable is the duty of every man who is interested in this important industry. This can only be done by constant care and unremitting attention. Nothing is easier than to allow sheep, more perhaps than any other class of stock, to run back in quality, and when once a bad strain gets a hold on a flock it is a labor of years to eradicate it. It should be the aim of every sheepgrower to keep nothing but the best sheep of the breed which he has found most profitable. If he cannot have the best, and few of us can, then let him exert himself to his utmost to bring his flock up to the highest attainable standard. This can only be done by carefully culling, with a view of preserving a good and defined type in the flock, both for form and for wool; by the judicious choice of rams likely to nick well with the ewes of the same flock; and by constant care and watchfulness. With regard to culling much may be said. Where the flock is small the owner has at shearing-time an excellent opportunity of examining almost every sheep passing through his shed, both as to form and wool. This is his opportunity for culling and should on no account be neglected. I lay stress on the importance of form in sheep because it is one of the surest indications of constitution; an ugly, ill-shaped sheep or other animal is seldom of sound, robust health Another point is that culling should always be heaviest amongst the young sheep; cull out the worst before they breed, and then in seasons to come there will be few of the older ones not worth keeping. Culling for age is another point for consideration. If a ewe is of good quality and sound she is worth keeping as a breeding ewe so long as she yields a satisfactory fleece; otherwise she should be got rid of. I believe the late Mr. John Murray bred from a ewe until she was 15 years old, and then when killed she was found to be in lamb. All ewes which are culled out of a flock should be sold as soon as possible, and cleared off the farm; when culled they become superfluous dry sheep, and if necessary or desirable others of a profitable quality might be obtained in their stead. Fences, however carefully kept, are seldom absolutely sheep-proof, and so long as the culls remain there is great risk of their returning to the flock at the time when the rams are in. The class of ram required in any flock must always depend upon the type of sheep aimed at, and the power of that class to produce the type from the breeding ewes he will have to tup. But whatever the type, always obtain the best rams in your power; other things being equal, choose rams with plenty of frame, as there is more often a tendency in sheep to decrease than to increase in stature. It must be remembered, however, that if the main object of the breeder be wool the paramount points to consider are the density, staple, lustre, and quality of the fleece. and I do not think these are ever found to perfection in sheep of inferior constitution. In small flocks requiring only a dozen or so rams, or even in larger flocks, unless of very excellent quality, it is not wise to breed one's own rams. I think it will be found to be much more satisfactory to purchase from the recognised studs a few rams as required, and this course also has the advantage of saving room on the farm and fencing. Sheep-farming is a special study. Even in large flocks of more than average quality, where it is found convenient and not disadvantageous to breed a few rams from the flock, it is advisable to purchase occasionally a few really good rams from the leading studs. There is one other point of very great importance which I will now touch upon. In travelling over the lower districts of the colony I have seen in small flocks of sheep, rams, ewes, and lambs of all ages grazing together in the same paddock. This is a state of things that should, under no circumstances, be allowed, and the man who does allow it will never keep together a flock worth owning. The period of gestation of the sheep is about five months, and when rams and ewes are allowed to run together from year end to year end not only will many of the ewes breed twice in the year, but will frequently be found suckling the lambs of both lambings for months after the second lamb is born. This leads to a serious weakening of the mother, a comparative starving in the lamb, and hence a certain and rapid deterioration in the flock.

Pine Forest, July 18.

Present—Messrs. W. H. Jettner (Chairman), J. Flowers, J. Phillis, W. Burgess, F. Inglis, E. Masters, A. Inkster, W. Wurfel, R. Barr (Hon. Sec.), and one visitor.

CATTLE DYING.—Many cattle have lately died, exhibiting symptoms supposed to be due to poison. They froth at the mouth, and die after a few hours' illness. No remedies have proved effectual after seizure. Cows in milk and in good condition were the victims as a rule. One farmer lost eleven head the past two years, and others up to half a dozen.

"LESSONS FROM THE DROUGHT."—Mr. R. Barr, jun., the Hon. Secretary, read the following paper:—

The effects of the late severe and protracted drought are both seen and felt by farmers and stockowners in this locality to-day, and in many cases the evidences are likely to remain for some time. Recollections of good working horses, dairy cows, and nice herds of young cattle, which in due course could have been sold to the butcher or used for the meat supply of the farm, together with nice flocks of sheep, actually starved to death, are not pleasant matters to write of or discuss, but if the combined experiences of the members can tend to mitigate the evils in future periods of scarcity the consideration of the subject must not be shirked. That the effects are further extended than the mere reduction of live stock below the effective working and provisioning of our farms no one can gainsay. Strenuous endeavors to save life were made, with the result that many animals miserably perished after "eating their heads off." This fact, added to the comparative failures in the crops, have left legacies behind in the shape of arrears of rent, interest, unpaid bills, &c., and is responsible for a general cessation of works of development or improvement on most farms. To sum up the lessons from the drought beyond Goyder's line of rainfall, I would describe as so severe that several years of good crops, with prices to match, must be experienced before a recovery is made. How best to avert loss in the future must be decided according to circumstances of individual members, but I submit for your consideration the following points, knowing, however, that the practice of these must be the work of a gradual evolution.

Fallowing.—This practice can be no longer ignored. The past two years' experience has exploded the theory of the hurtful effects of fallowing our light scrub lands, except as regards the tops of the sandhills, which drift badly. The flat portions and the lower half of sandrises may be ploughed up in July and August if moist enough, and if half of the land to be cropped the following year is so treated we not only have the advantage of getting our crops in better and quicker, but we conserve a good deal of the previous season's moisture for the portion fallowed, and may reasonably expect much better results, especially where the seed and fertiliser drill is used.

Cutting and Binding Part of the Crop for Thrashing or Heading.—Having practised this method for a number of years, I can speak with some degree of authority, and take this opportunity of recommending it. Commencing with the most forward portion of the crop from ten to twelve days before ripe, a good deal of risk by storms or hot winds is escaped. Put it in large stooks close up to the binder and stack it all before stripping the remainder. The straw will then be of use for fodder, and if not actually required during the next season can be kept till it is required.

A Plentiful Supply of Hay in Fair to Good Seasons.—Most, if not all, of us must plead guilty to neglecting this matter. On many farms little or no hay is cut, the owners trusting to be able to pull through with "cocky chaff" and the wheat screenings, with the addition maybe of a few bags of bran and pollard. In a favorable season, when early rains fall, the months of winter are passed over with a little manœuvring, but hay a year old is a rarity, and it ought not to be so. Hand-to-mouth dealings in most things have been caused by seasons of poor crops and prices, and until farmers are enabled to keep two years' horse-feed on hand, and will do so when they can, losses of like stock, or great expense to avert same must ensue when drought again comes. I estimate the quantity of hay required at 10 tons per 100 acres cropped, when heading or thrashing is not practised, and the strict saving of all winnowings.

In the discussion which followed it was observed that small paddocks are of great advantage, especially where sheep are kept, and change them every week or so. Even a change from a good paddock to an inferior one is beneficial. The use of fertilisers is expected to work a reformation in respect to feed, as it is likely that the effect will last for two or three years afterwards and benefit the grass.

Swan Reach, July 10.

Present—Messrs. P. A. Hasse (Chairman), R. Barrow, W. G. Wilson, L. Fidge, B. Schwarz, P. A. Beck (Hon. Sec.), and three visitors.

BRANCH SHOW.—Efforts to be made for holding a combined show of products by the river Branches of the Agricultural Bureau.

WHEAT GRUBS (?)—Numbers of grubs have appeared amongst the wheat crops, and are destroying large areas. Members desire to find a remedy. [And yet the first notification only reached this office on August 7. Is the pest "grubs" or "caterpillars"? If caterpillars, mix 8ozs. Paris green and 3lbs. sugar with 30lbs. bran and enough water to make a thick paste. Divide into pellets the size of a Barcelona nut, and lay down where the caterpillars are found.—GEN. SEC.]

Wandearah, August 2.

Present—Messrs. G. Robertson (Chairman), G. Collins, W. Roberts, W. Munday, W. Halliday, E. Joyce, E. Jacobs, W. J. Fuller, C. E. Birks (Hon. Sec.), and one visitor.

DAIRY INDUSTRY.—It was agreed that the returns from the dairy industry in this district are most unsatisfactory, and that co-operation is needed to overcome the difficulty. Members were of the opinion that as much ensilage as possible should be made during favorable seasons; that this would be a good means for utilising dirty crops and rubbish in general. Pit ensilage was preferred to stacks, and sour ensilage in preference to sweet ensilage for cows in milk. They consider that salt is necessary for stock; and, although in places there is enough salt in the herbage, there are parts where it must be supplied to the cattle. One member places salt in a barrel of water alongside the pure water trough; others prefer to place salt in pans, or to provide rock salt. Members wish to discover why cattle chew bones. [Sometimes for want of common salt, more often through a craving for phosphates, and generally through having acquired a bad habit. Cattle and all grazing stock will leave other pastures to feed on herbage growing where phosphatic fertilisers have been applied.—GEN. SEC.]

ENSILAGE.—Mr. G. Robertson read the following paper:—

My object in bringing this matter before this Branch is the importance of providing feed for our dairy stock during the summer months and years of drought. Sour silage is what is considered best for milch cows, and what I have been most successful with. The advantage of silage is that any fodder that is suitable for stock in its green state will be improved by being made into silage. Wild oats and any grasses that are to be found on our farms will all make good silage. I prefer the pit system; and the crop should be cut immediately after blooming and carted to the pit at once, spreading it evenly, and the pit filled about 3ft. above the surface; then spread some old bags over the lot and fill enough bags with earth to make a row all round the pit; then fill in the middle with loose earth, enough to form an arch. And should you be anxious to make the most of your space, take off the weight after four or five days, put in more greenstuff, and put on the weight as before Now, the advantage of ensilage is it is the best that can be got for producing milk and butter during the summer months, and the butter will be a good color. The work should be done before haymaking commences. The headlands of a field, and even patches of wild oats that would yield no wheat, and mustard or other weeds objectionable in the crop, can be cut and carted in a green state, and their seeds prevented from soiling the land for another year. Silage can be compressed into a very small space, and if properly weighted will keep good for an indefinite time.

Richman's Creek, July 24.

Present—Messrs. W. Freebairn (Chairman), A. Knauerhase, J. J. Searle, J. McSkimming, F. Mattner, P. J. O'Donohue, M. Hender, E. Roberts, J. M Kelly, A. Nicholson, and J. McColl (Hon. Sec.).

ANNUAL REPORT.—Ten meetings held, average attendance, 11; five papers read; several other interesting matters discussed. Season disappointing, though better than previous one. Feed more abundant than last season, and stock in better condition. Membership made up to fifteen last March.

OFFICERS.—Office-bearers thanked and re-elected.

FARM HORSES.—Mr. O'Donohue read a paper, of which the following is an abstract:—

Five years of drought has resulted in the loss of a great number of draught horses and young stock, and few farmers here are in a position to replace them by purchase, and the only way is to breed from the best that are left. The quality of farm horses is not so good as it was a few years ago, and this is attributable to the generally inferior stallions travelling. He had brought some light, strong, active mares into the district over twenty years ago; but for the reason just stated the results from breeding were very disappointing. To improve the neither useful nor ornamental class of stock now held it was absolutely necessary to have the services of a pure-bred draught stallion—not necessarily a great prizetaker, but one with a genuine pedigree. Mr. O'Donoghue then detailed the characteristic points of the pure-bred Clydesdale horse, which he considers to be the only pure draught breed to be found in this colony.

Mr. Knauerhase agreed that there is much need of improvement in horse stock, and that farmers should give every encouragement to any good stallion that should travel the district. Mr. Hender's experience showed him that it did not pay. He had tried mares several times, but had very few foals. Mr. McSkimming thought that young stock had been stunted from want of feed during the past few years. The general opinion was that if seasons improve an increased number of horses will be received into the district.

Forest Range, July 20.

Present—Messrs. J. Vickers (Chairman), J. Sharpe, R. E. Townsend, C. Stafford, and R. M. Hackett.

Wattles.—Mr. Stafford read a short paper on the cultivation of wattles. Before sowing he placed the seed in cold water, put it on a fire, and brought it to the boil. When cold remove the seed and sow at once. On hard land about 2lbs. of seed per acre was required, but on loose stony land half that quantity is sufficient. He preferred to leave all logs, fern, and other rubbish on the land until the wattles are 2ft. to 3ft. high to protect them. If the land is covered with small timber and scrub cut it down and leave until dry enough to burn, then sow about 1lb. per acre of dry wattle seed and set fire to the scrub, &c. After the fire let all shoots. &c., grow until the young wattles make a fair start. The Chairman thought it sufficient to burn the rubbish off the ground after sowing the seed without first soaking the seed. It was advisable to plough the ground or cover in the seed by some other means. Mr. Townsend said it was important that cattle and sheep should be kept out of the plantation until the wattles were beyond their reach.

Woodside, July 24.

Present—Messrs. R. W. Kleinschmidt (in chair), J. H. Snell, R. Schroeder, E. E. Esau, A. Lorimer, A. S. Hughes, F. Heidrich, J. Cuthbertson, A. Pfeiffer, R. P. Keddie, C. W. Fowler, G. F. Lauterbach (Hon. Sec.), and one visitor.

Tuberculosis.—Mr. Cuthbertson read a lengthy paper, of which the following is the substance:—

He admitted that he found it impossible to draw any correct conclusions as to how far the milk supply to factories and private consumers is affected by tuberculosis, and quoted several conflicting statements made by authorities (or supposed authorities) upon the subject. It did not follow that because a cow was tuberculous her milk was necessarily liable to convey that disease to the consumer of that milk. The consensus of scientific opinion was that the milk was perfectly wholesome and innocuous if the udder were not affected by the disease. He strongly deprecated alarmist statements which had been circulated regarding the prevalence of tuberculosis in the Australian colonies, and was pleased to note that there was a disposition in some quarters to pay compensation where animals were discovered to be free from the disease after having been slaughtered. He said the tuberculin test was not reliable, and instanced a case in Denmark where, on May 8, 1897, 1,791 head of cattle were tuberculined. Of these 678 reacted and were slaughtered, of which 57 were free from the disease, 19 badly affected, and 602 slightly affected, and were sold as food. The English Royal Commission on tuberculosis reported that the tuberculin test was infallible upon the experiments made by Professor McFadyean, but he has apparently found reason to modify his opinion recently. There are so many influences constantly or occasionally present in the animal which may affect the animal during the test that these (allied to the complication of the test) can only be understood and allowed for by a skilled observer; therefore, tuberculin is not a reliable test in the hands of unskilled persons. He then referred to the effects following injection of tuberculin, and drew attention to the fact that the percentage of tuberculous udders is very small; argued that, even if the milk of one cow in a herd were affected, it would be rendered innocuous by admixture or dilution with the milk of a number of healthy cows, and further, that milk affected with the tubercle bacillus can easily be rendered perfectly innocuous by being subjected to a temperature of 185°F. for three minutes. In some cases a cow might be in quite good condition and present no indication of tuberculosis for a long time when the attack is only slight. The symptoms of a more advanced stage were then described. The disease is not nearly so communicable from beast to beast in Australasia, where the animals live in the open, as in Denmark, where they are housed for the winter, and where the mucus or watery discharges from the nostrils and throat are scattered about the byres. He concluded that the disease is not very liable to be transmitted to human beings through the milk supply of our factories because, firstly, tuberculosis of the udder is the only way the disease can be transmitted through the milk supply; secondly, the disease exists to such a very small extent that it is hardly recognisable; thirdly, if the disease did exist, as some people would have us believe, the milk (after having been mixed with twenty times its own volume) would fail to establish the bacilli, apart from the fact that the quantity is reduced to about one-tenth in the manufacture of both butter and cheese. This proves conclusively that there is much less danger from the disease in cheese and butter manufactured from a large milk supply than from that made on a farm or in a small way.

Mr. Hughes did not think tuberculosis is very prevalent amongst cattle. Mr. Keddie said the matter should be very closely watched by scientists. He thought the way our cattle are exposed to all sorts of weather was most likely to be conducive to contraction of the disease—more so than in Europe, where cattle are housed, and where greater attention is paid to the health and condition of the animals. Mr. Heidrich contended that exposure to vicissitudes of weather tended to harden them against disease. Mr. Snell said the idea that the admixture of a small quantity of tuberculous milk with a large quantity of sound, wholesome milk would not increase the dangers from the tubercle bacilli was opposed to scientific research.

Davenport, July 28.

Present—Messrs. W. J. Trembath (Chairman), J. E. Lecky, T. McDowell, F. B. Rathbone, J. Holdsworth, A. McDonald, and J. Roberts (Hon. Sec.)

SHEEP, POULTRY, AND PIGS.—Mr. McDonald read a lengthy paper. The following is a short abstract:—

Wheat-growing is not as profitable as it was twenty to thirty years ago. Low prices and bad climatic conditions are the cause. Wholesale destruction of forests has largely contributed to scanty rainfall, &c. Advised extensive planting of trees by farmers, available free of cost at the State forest nurseries; stated the numerous advantages to be derived from planting forest trees—beautiful surroundings, value as timber, shelter for stock, &c. To make farming profitable recourse must be had to other items than wheat and other cereals.

Sheep, &c.—In his opinion there was nothing that would pay better, with good management, than sheep, poultry, and pigs, but great care and judgment is necessary in selecting the breeds in the various classes for this purpose. Sheep are the most important factors on the farm. He favored the Shropshire-merino cross, and would select large-framed merino ewes to mate with the Shropshire rams, both sides as pure as possible. These would give large, hardy, early-maturing lambs for export, and if sent to market in tiptop condition would always gain satisfactory prices. The land would be fertilised by the sheep and kept clean, butchers' bills avoided, annual clip of wool, fat, and skins would bring in ready cash. Skins should be kept under shelter, kept clean both on wool and flesh sides, stretched where possible; otherwise, leave trotters on, hang over rail in shed directly after removal from sheep, pull tight, drive a nail at extreme ends of neck and tail, dress with weevil wash, obtainable from any skin salesman. Hides should be treated similarly ; avoid cuts and scores, spread out in shed, sprinkle salt freely on flesh side, leave till the salt has taken effect, then roll up tightly and send to auction. Through carelessness with regard to the treatment of hides and skins it is estimated that an annual loss in Australia is suffered to the amount of £102,453 on sheepskins, and £54,000 on hides. It will not pay to keep inferior animals on holdings of 1,000 acres and upwards, and overstocking must be carefully avoided. On smaller holdings sheep would have to be omitted and pigs and poultry taken up.

Poultry.—He thought there is a great future in the export of poultry. England imports £5,000,000 worth of eggs annually. New South Wales sent 50,000 head of poultry during the past two years. America's last year output of poultry was nearly £60,000,000 in value, more than that of the wheat crop and worth twice the value of the sheep. He next described the various table breeds and the egg-laying breeds, together with the best crosses for each purpose. If it paid foreigners to export as much as 150 tons of eggs in one vessel, to be followed at once by other vessels similarly laden, as was actually the case, surely it would pay Australians to try a hand in the game. He strongly condemned trees as roosting places for poultry. Iron houses should be provided, with as little wood as possible, leaving 4in. open at top for ventilation; have perches swung with an iron rod, to guard against ticks; build away from stables and other erections. Directions as to feed and water were repeated, similar to those given by Mr. D. F. Laurie in *Journal of Agriculture and Industry.*

Pigs.—Mr. McDonald preferred the Berkshire, but bacon-curers object that black pigs do not make as saleable sides of bacon as white pigs do. Berkshires are more productive as regards yield of bacon, and have less offal than any others. A cross with Yorkshire should give just what is wanted. Over-fat bacon is not saleable now, and pigs from 80lbs. to 100lbs. dead weight would, I think, suit all buyers. Farmers would probably do best by selling to factories or exporting. Factory bacon is decidedly better than farm cured, both in quality and appearance. To get good results the boar should be kept in vigorous condition, not too fat, and have plenty of exercise. The sow should be long, rangey, not less than twelve teats, starting quite near the fore legs, giving her litters plenty of room to suckle. She should have more exercise than the boar, as it is often fatal to both sow and pigs to have them shut up in a pen while carrying her young. Feed her on swill for a week before she is expected to litter, give her a pile of straw to bury herself in, and let her be as quiet as possible. After a day or two, when she has littered, give all the food she can eat, with plenty to drink all the time. There is no time young pigs can be grown so cheaply as when they are on the sow. If shut up, give plenty ashes, a little sulphur and salt occasionally, and keep the pen dry and clean. Castrate the boars when a month old. If there is a supply of milk they can be easily weaned; but if not, give a swill of bran shorts and a little crushed oats. The cheapest and best food at present for pigs is oats with a little wheat now and then; but the best results accrue from the use of barley meal with separated milk and potatoes. These foods make the best quality of pork, and no feeding stuff will pay better. Crops that will not pay to reap for milling purposes could always be fed profitably to pigs and poultry.

Mr. Rathbone agreed with the essayist, except with regard to crossbred sheep, which are fence-breakers, and therefore less suitable than pure breeds for farmers.

Mannum, June 30.

Present—Messrs. J. G. Priess (Chairman), A. G. Lenger, F. E. Schuetze, R. Heidrich, W. Kowald, and B. Baseby.

DAIRYING.—The Chairman reported that the pure-bred Jersey bull, The Baron, loaned to the Branch, had arrived and was in good condition. It was resolved that the fee for service be fixed at 2s. 6d. per cow for the present.

CONFERENCE OF BRANCHES.—Bowhill Branch suggested that a conference of the River District Branches should be held at Mannum. Members favored the idea, and suggested some time in February as a suitable time. It was resolved to hold a field trial of agricultural implements during August.

STARLINGS.—Mr. Kowald reported that these birds were increasing rapidly, and were more destructive than sparrows.

EXHIBIT.—The Chairman tabled well-grown samples of Washington Navel oranges grown by himself.

Kapunda, August 5.

Present—Messrs. H. T. Morris (Chairman), W. Flavel, G. Teagle, T. Scott, Peter Kerin, J. J. O'Sullivan, J. H. Pascoe, G. Harris, W. M. Shannon, Pat Kerin, J. A. Schultz, and T. Jeffs (Hon. Sec.).

TUBERCULOSIS IN CATTLE.—Mr. G. Teagle read a paper on this subjects He observed that it is not a new disease, as the ancient Egyptians had law. with a view to its prevention. It will not grow under a temperature of 90° F. It was not known forty or fifty years ago that tuberculosis in cattle and consumption in human beings are one and the same disease, and at that time dairy herds were not so large as now. It is well known now that the disease is communicable from the beast to mankind. It is the duty of everyone who can detect the disease to communicate his discovery to the owner of any affected beast, and also to the Board of Health. Both the flesh and the milk of tuberculous animals are dangerous to consumers, but the dangers may be avoided if the milk is subjected to a temperature of 200° F. for three minutes, or if the meat is well cooked. The disease may exist in a cow for some time before the owner can detect it. [Milk from tuberculous cows (unless it is first boiled or brought just up to boiling point) is especially dangerous to children and invalids, because it is so often used for dietary purposes in such cases, and the consumers are weak.—GEN. SEC.] Fat cattle are quite as liable to contract the disease as poor animals. A tuberculous cow had been killed and partly burned; some pigs ate the unburned flesh, and when the pigs were killed and cured the tubercle bacillus were found in the bacon. Mr. Teagle then gave several instances of the prevalence of the disease in England, both amongst cattle and human beings. He also advocated the establishment of a fund to reimburse owners of cattle which have to be slaughtered in consequence of the disease.

Johnsburg, August 5.

Present—Messrs. T. Potter (Chairman), J. Sparks, G. H. Dunn, H. Napper, H. Arnold, T. W. Smith, T. A. Thomas, T. Thomas, W. McKitchie, L. Chalmers, F. W. Hombsch, T. Johnson (Hon. Sec.), and one visitor.

FARMERS' CO-OPERATIVE LOAN FUND.—Mr. T. A. Thomas read a paper advocating the establishment of a co-operative loan fund from which farmers and other producers could borrow money at low interest. Considerable discussion ensued, and it was resolved to submit the paper for consideration at Congress. Members generally approved of the scheme outlined by Mr. Thomas.

EXHIBIT.—The Hon. Secretary tabled first-class sample of Early Snowball turnip grown without irrigation.

Albert, August 5.

Present—Messrs. J. Wetherall (Chairman), W. H. Clarke, R C. Rasmussen, A. B. Struthers, C. Setterberg, R. Norton, T. Cooper, H. J. Smith (Hon. Sec.), and three visitors.

BRANCH SHOW.—It was decided to co-operate with other Branches on the river in holding a show of produce at Swan Reach, on September 21.

POTATOES.—A discussion took place on best varieties of potatoes for this district. The Chairman put White Elephant first, then Early Rose and Beauty of Hebron. Regents and Magnum Bonum had not been a success.

MANURES.—A general discussion ensued on the use of manures.

Gumeracha, July 24.

Present—Messrs. W. A. Lee (Chairman), A. Moore, W. Cornish, W. Green, D. Jameson, J. Monfries, R. P. Scott, A. E. Lee, D. Hanna, Dr. Stephens, and Dr. G. Nicholls (Hon. Sec.).

POTATO DISEASES.—Members asked for information *re* black spot and red spider on potatoes. [Treatment for red spider was published in August issue of *Journal of Agriculture*. For the disease known as "black spot," "early blight," &c., of potatoes no curative treatment is known. Once the plants become affected the development of the tubers seems to cease. Spraying the plants at intervals of two or three weeks, without waiting for the disease to appear, is reported to be a sure preventive of this trouble.—GEN. Sec.]

IMPROVEMENTS IN AGRICULTURAL IMPLEMENTS, &C.—Mr. Moore read a lengthy paper upon this subject, dealing with the improvements made in agricultural implements and machinery. and the reasons and necessity therefor from the times of the Pharaohs until the present day. He regarded the disc plough as the latest and probably most important improvement in that direction. He could see no advantage in drilling seed, as he thought the broadcast sower answers the purpose, but there was no satisfactory way except through the drill of distributing manure along with the seed. The reversible peg-tooth harrow and the disc harrow appeared to him to be more practically useful than any other form. The double roller, with shafts or pole, he considered to be far and away the best, and the convenience in turning well repays the additional cost. For hay-cutting the binder is unquestionably the proper implement; but for harvesting wheat a complete implement is needed. In California the farmers use a machine which reaps, thrashes, cleans the grain fit for market, at a cost of 4½d. per bushel, deposits the bagged grain in lots of five bags on the field, and places the straw in heaps of about 5cwts. The machines are worked by steam, but might be made smaller to work by horse-power. The straw could be stacked to provide food for stock during periods of drought. These machines enable the Californian farmers to harvest their grain at a very low cost, and the sooner Australian farmers recognise the fact the better will it be for the wheat-growing industry. He referred in eulogistic terms to the "Planet Junior" implements for horticulturists and to the centrifugal separators and many other appliances used in modern dairy work. He regretted that, for the most part, horse-power is chiefly used by farmers, but hoped to see other motive powers used in the near future, winding up with the wish that colonial manufacturers would be able to compete successfully with the American and other firms, from whom our farmers in 1898 purchased implements and machinery to the value of £40,719, paying a duty of £3,840. Mr. Green favored the rotary disc plough, which thoroughly pulverised the soil. Mr. Jameson said competent men should be obtained to work their machinery, and lessen the draught by keeping everything in good working order. He favored the use of the seed drill, the light roller, and the binder and header. Mr. Cornish strongly favored the seed drill, and thought the old methods of harvesting more suitable for the hilly portions of the district.

Mannum, July 29.

Present—Messrs. J. G. Priess (Chairman), A. Faehrmann, G. A. Schulz, R. Heidrich, W. Kowald, B. Baseby, and F. E. Schuetze.

Field Trial.—Arrangements for field trial of implements, to be held on August 16, took up most of the time.

Harrowing.—Mr. Schulz reported that wheat drilled in appeared to do better if it was not harrowed afterwards.

Tree-planting.—The Chairman reported having planted 300 sugar gums in bamboos. He made a rough enclosure with split bamboos, and the trees were looking well notwithstanding the succession of cold nights.

Narridy, July 29.

Present—Messrs. A. McDonald (Chairman), H. Nicholls, D. Creeden, E. Smart, W. J. Martin, R. Satchell, and J. Darley (Hon. Sec.)

Standard Bushel.—Mr. Nicholls said it might be well to fix a standard sample for all time, because about 75 per cent. of the wheat raised by the farmers of this district, situated near the market, was delivered subject to the standard fixed for 1898, viz., 62lbs., and it was very unfair to those less favorably situated to have to submit to a 63lb. standard (as fixed for 1899) for the whole of their wheat. All wheat under the average standard should be docked proportionately, and higher prices should be paid for samples above the average, according to quality. Mr. McDonald said the system of selling barley in Scotland was upon a fixed standard, and prices ruled accordingly; samples above standard quality received higher prices, and those below got less.

Tatiara, July 29.

Messrs. Thos. Stanton (Chairman), R. Scown, F. Smith, J. Rankine, H. Killmier, E. Prescott, C. H. W. Wiese, D. Makin, Thomas Hall, and W. Montague.

CONGRESS.—The question of reduced rail fares for delegates to Congress and the freights on manures and implements were suggested for discussion at Congress. Mr. Rankine offered paper on "Licensing of Stallions," and Mr. Killmier on "Draught Stock."

JERSEY KALE.—Mr. Montague distributed amongst members a number of plants of the Jersey tree kale.

Caltowie, July 31.

Present—Messrs. J. G. Lehmann (Chairman), A. McCallum, J. Noonan, D. Wilson, R. J. Neale, J. Neate, J. Potter, G. Petatz, L. Graham, P. O'Loughlin, A. McDonald (Hon. Sec.), and three visitors.

MALTED SEED WHEAT.—Mr. McDonald tabled wheat in various stages of malting and mouldiness from a plot drilled with manure early in April, and which had been a complete failure; broadcasted again on June 20, the second sowing threatened a similar result. It was suggested that perhaps the pickle was too strong; but some members considered the seed had been covered too deeply.

DEEP V. SHALLOW SOWING.—Most members favor the soil being worked to a free tilth, and to cover the seed about 1¼in. Mr. McCallum referred to a crop of lucern which had been broadcasted on top of the soil. This was growing well, whilst some in the same paddock that was drilled at the same time had not yet appeared. Members consider, however, that the drilled crop will eventually prove the stronger.

"THE HORSE—HIS BREEDING: A TYPICAL CLYDESDALE.—Mr. McDonald read a lengthy, interesting, historical, and critical paper under the above heading. The following is an abstract:—

The most useful variety, from the farmer's point of view, is the draught horse. Coming down chiefly from the old Suffolk and Flanders breed, standing upon short legs, with low and straight shoulders, thick withers, deep and round chested, usually carrying a large head, stout and strong in the quarters, full in the flanks, and short in the pasterns, he gave every embodiment of strength. The most popular and perhaps the most pure and distinct class of draught horse in existence is the Clydesdale, owing its origin to a cross from the Lanark or Scottish mares and Flanders stallions, furnishing the purest, best, and most useful class of draught horse found to-day in Australia—compact, muscular, a good stepper with a long stride, capable of drawing a heavy load and quickly covering a long distance. This strain of draught horse has not been produced by any accidental mixture, but through a course of continued judicious cultivation.

At considerable risk and expense, with loss sometimes, have some of the purest strains of Clydesdales been imported into this colony by enterprising colonists, and it is most regretful that farmers generally have failed to appreciate the opportunities thus afforded them of improving their horse stock.

Whilst there is some foundation for the saying that "like produces like,' he entirely disagreed with the idea that one has only to find a sire and dam in comformation and shape just to one's liking, and the progeny must as a consequence possess that conformation, size, and utility. How very often in such cases a flaw of one or two generations back is entailed in such progeny. Constitutional diseases may escape the immediate produce, and yet appear in the next generation; hence the necessity for some knowledge of the parentage of both sire and dam. Too much attention is directed to appearance, and not enough to blood and lineage. The farmer is introduced to a sire possessing size, symmetry, and substance—almost the ideal, apparently, of a perfect draught stallion, but without the slightest pretension to classical blood or pedigree. The small fee claimed for his service adds a further inducement, and one of the best mares on the farm is mated with him. The result is a weedy nondescript, though possibly it may give some promise of quality, but when an attempt is made to breed from this second generation, disappointment ensues. Very often the unskilled or careless breeder fails to pair his animals so as to ensure best results. Their good points to some extent will be lost, and the defects of both probably increased, while the produce will in all likelihood be inferior both to sire and dam. It *may* be desirable to raise half or three-quarter bred horses for different purposes and varying work on the farm, but to attempt to breed from such stock can only end in a dismal failure; and this practice, he suggested, would account largely for the great number of weedy horses now existing in South Australia. The draught or farm horse should be maintained by patronising only the best blood and adhering strictly to the purest strains. The typical Clydesdale has a well-proportioned head, a little full across the nose; forehead broad; ears long and sharp; nostrils large; neck well let into the shoulders and crested; shoulders not too straight, so as to admit of good action (for short stages, heavy lifts, and hilly country, a much straighter shoulder is preferable); chest broad and strong; barrel well rounded, ribbed up, and running well into the quarters; muscular thighs; clean cut and large hocks and knees; pasterns not too straight; bare and well developed hoofs; legs of large flat bone, carrying a good supply of fine hair; standing about 16 hands high; of a rich brown color, with, perhaps, some white markings on the face and legs.

Mount Pleasant, August 11.

Present—Messrs. G. Phillis (Chairman), J. F. Miller, J. Maxwell, P. Miller, J. McConnell, H. Dragomuller, R. Godfree, W. Vigar, W. Lyddon, W. Royal, F. Thomson, L. McBean, and J. A. Naismith.

RAINFALL, &c.—For July, 0·32in.; last seven months, 10·30in. Stock doing well, but have gone back through frosts, which have been the heaviest known for years; of twenty-two nights twenty were frosty.

SHEEP.—During a discussion on the different types of merino sheep, Mr. McBain mentioned that he had introduced fresh stock, which he hopes will enable him to get density and length of staple.

Millicent, August 3.

Present—Messrs. R. Campbell (Chairman), A. McRostie, H. A. Stewart, G. Mutton, H. Hart, W. J. Whennen, B. Varcoe, W. H. Rich, L. Oberlander, W. R. Foster, H. Warland, S. J. Stuckey, H. F. Holzgrefe, and E. J. Harris (Hon. Sec.).

CODLIN MOTH.—Members consider that, in the interests of districts that are still free from the codlin moth pest, the regulation prohibiting the sale or distribution of affected fruit should not be relaxed. It was stated that where onions are planted under the trees the moth will not deposit its eggs on the fruit, and one member stated that for twenty years he had no fruit on his trees, but when he began to grow tomatoes under the trees he got fair crops. [Do not place any reliance upon these practices. Superstition is very hard to kill.—GEN. SEC.] Mr. Hart advised growers to take home no cases that had been left in fruit shops.

MILK FEVER.—Mr. G. S. Thomson wrote that iodide of potassium is risky treatment in unskilled hands. In Great Britain the treatment frequently adopted, when the disease appears (about twelve to eighteen hours after calving), give five or six glasses of whisky (a little over half a bottle) in an equal quantity of water. Follow this up by giving 1oz. of chloral hydrate and ½oz. doses every three or four hours after. Keep the cow on her belly and turn over occasionally. Milk fever rarely attacks cows until after the third calf, and then is more prevalent in over-fed animals and heavy milkers. Laxative food ought to be given prior to calving, and a dose of Epsom salts. The symptoms of milk fever are a dullness and lowering of the head very often, with rolling unsteady gait and staggers. The eyes are half closed and the animal becomes unconscious. The frequent symptom is the low temperature instead of the expected increase—sometimes as low as 95° F. After calving the cow should be milked often.

STOCK STEALING.—At the previous meeting Mr. Stewart read an article from the *Australasian* (with remarks of his own) which has a local application. The following are the leading points :—

> The article stated that thefts of sheep and cattle are very frequent; that stockowners have great difficulty in obtaining a conviction A large proportion of the thieves are quite young men. In many districts there are residents who own no stock, save a milch cow, who are scarcely ever known to buy butcher's meat, and yet never want it. From such persons dealers can generally buy, at a low price, a small parcel of sheep skins, and no questions asked. Among remedial measures, registration of ear-marks has proved to be considerably effective in New South Wales. Some people had stated that small holders would object to registration of ear-marks as a reflection upon their honesty, but this statement was most unjust in regard to the large body of small stockholders in South Australia. The fact that sheep and cattle may be stolen almost with impunity is having a bad impression on some of the rising generation. They are brought up to regard the practice as an easy means of getting money; they are educated in crime, and when old enough they think it no wrong to lift sheep and cattle when an opportunity offers. Another encouragement to the young stock-stealer is the fact that facilities are afforded for the disposal of stolen sheep and cattle, and every difficulty appears to be thrown in the way of obtaining a conviction against the thief. Some means of identification of people who send small lots of sheep and cattle to market should be provided. The custom has been for some one (often no one knows who) to engage trucks to convey so many sheep or cattle to market, and, so long as the trucks are paid for, apparently no notice is taken as to who uses them. The stolen animals are sent to a stock agent with instructions to sell and remit the proceeds to a certain name and address, usually a post office. The letter is delivered in due course, little or no notice taken of the person asking for it, and the cheque is cashed in the same way. A man may arrange to have trucks ready at a certain station on a certain day, lift the sheep or cattle during the night, truck early next morning, and before the owner found out his loss the animals are sold, and the thief (who, by the way, no one has seen) has pocketed the money they realised. This is no imaginary case : it has happened on many occasions in Victoria. The number of small holders is rapidly increasing, and in some localities, adjacent to large areas of scrub, it is by no means an uncommon practice for stock to be stolen merely for their skins. It is usually some time before the loss is discovered, and then a watch is kept on the markets to seize the sheep when brought in for sale. In the meantime the skins have been sold, and probably fellmongered before the search for the sheep has commenced.

Mr. M. Geoghegan, a visitor, expressed his appreciation of the paper read by Mr. Stewart at the previous meeting. Emphasis should be given to the matter, as few knew to what extent the evil was prevalent in the back country. He suggested an association to employ a smart man to look after stock sent by rail. Mr. Stuckey thought it was a matter for the police department. The Chairman thought farmers might form an agency and sell their stock only through the agency, or forward direct to market and send a man in charge, or even sell them, as he was convinced that the present was far from satisfactory. Mr. Warland said at present owners and buyers of sheep sold out of pound were in an awkward position. Owners had reason to fear there were more sheep owned as "bought out of pound" than were ever impounded ; and honest men who bought sheep out of pound had no guarantee that sheep would not be claimed from them. All sheep sold out of pound should be fire-branded.

Cherry Gardens, August 8.

Present—Messrs. T. Jacobs (in chair), G. Lewis, C. Lewis, G. Patten, J. Richards, A. Broadbent, J. Mackereth, G. Hicks, C. Ricks (Hon. Sec.), and two visitors.

HILLS BRANCHES CONFERENCE.—Members will attend the conference at Clarendon on October 12.

PRUNING.—Decided to hold a pruning demonstration at next meeting; each member to prune a tree, and give his reasons for his method.

RABBITS.—Rabbits are increasing rapidly in this district. The Hon. Secretary has proved that the females raise a brood about once a month.

Kadina, August 3.

Present—Messrs. T. M. Rendall (Chairman), Peter Roach, S. Roberts, S. Small, T. H. Warren, R. Johnson, T. E. Putland, James Martin, D. Taylor, and W. J. Taylor (Hon. Sec.).

Sheep and Sheep-breeding.—Mr. T. H. Warren's paper, as read at the previous meeting, was discussed. All members appreciated the great practical value of the paper, as a production from the pen of an experienced man, thoroughly well acquainted with his subject. Mr. Roach said sheep-keeping was all right so long as the proper kinds of sheep were selected. He had seen rams and ewes paddocked together all the year round, and they never had their lambs at the proper season, but at all times of the year, which was most objectionable. Merinos were the best, because their wool brought the highest price, they reached maturity at four years, and they cost no more to keep than poorer sorts. Mr. Warren stated in his paper that the best time to cull was at shearing; but, if every one did that, the price would be largely affected unless they were in a condition to be sent to the freezing depôt for export. That was where the advantage attached to the depôt came in—they found a ready outlet for surplus stock. For export, only the best sorts should be bred. The best cross was between Southdown rams and good crossbred ewes. It was not always wise to export heavy carcases, as the London market preferred medium weight of best quality. Sheep would be at that stage at four years old. Breeders should export all wether lambs and keep the ewes for breeding. A good lamb should net 8s. 6d. to the exporter. Three half-pence per pound would pay all costs and expenses connected with the export, and one firm in the city would advance 2d. per pound on all carcases shipped. He advocated chilled cars on the railway lines, the employment of a butcher for killing lambs locally, and public abattoirs alongside one of the local lines, so that the lambs could be killed and placed at once in the chilled cars. This would save risk of damage. Lambs should never weigh less than 30lbs. when dressed; they should not be driven more than ten miles, as they lose weight rapidly. Mr. Johnson had always found merinos easy to keep in the paddocks, but crossbreds were bad for fence-breaking. Mr. Roberts found it most profitable to purchase sheep after shearing, and fatten them for market. Mr. Martin thought the proper season for lambs was April.

Mice.—Mr. Putland showed samples of the damage done to his green wheat-plants by mice.

Mount Remarkable, August 17.

Present—Messrs. A. Mitchell (Chairman), G. Yates, C. E. Jorgensen, T. P. Yates, J. B. Murrell, T. S. Bishop, and T. H. Casley (Hon. Sec.).

Hints to Farmers.—Mr. Jorgensen read a paper on this subject. A short discussion ensued.

Lyrup, August 1.

Present—T. Nolan (Chairman), J. Sykes, W. Healy, T. R. Brown, J. Tye, A. Pomeroy, D. J. Tree, A. Menzies, O. Klemm, W. H. Wilson (Hon. Sec.), and six visitors.

Agricultural Education —Mr. S. Phillips gave an interesting account of the system of agricultural education adopted at the various public schools. He made special reference to the Agricultural School at Adelaide. Matters of local interest were also discussed.

Pyap, August 16.

Present—Messrs. B. T. H. Cox (Chairman), W. Axon, A. J. Brocklehurst, C. Billett, E. Robinson, G. Napier, J. Harrington, C. E. Coulls, J. F. Bankhead, J. Arnold, W. C. Rodgers (Hon. Sec.), and two visitors.

Wheats Grown on Murray Flats.—The following information was received from Messrs. Jackett Bros., millers, of Morgan, in reference to alleged inferior quality of wheat grown on the river flats. They were of opinion that the wheat grown on the lagoons was deficient in gluten, as the flour made from such wheat was short and dry. There is also a peculiar flavor, due, they thought, to the land not having been cultivated before. A slight foreign flavor was also noticeable in wheat grown on new mallee land, but after a few crops had been taken off this entirely disappeared.

Murray Bridge, August 12.

Present—Messrs. F. H. Wurm (Chairman), W. Schuman, Heinrich Schubert, J. G. Jaensch, B. Jaensch, W. Schubert, Herman Schubert, W. F. Wundersitz, J. G. Neumann. R. Edwards (Hon. Sec.), and one visitor.

Early Wheat.—Mr. Herman Schubert tabled sample of green wheat about 4ft. in height and in ear. It was sown with manure in April. The ears were well developed and fairly healthy, but there were signs of red-rust on the flag.

Tree-lucern.—Mr. Neumann tabled sample of tree-lucern (Cytisus proliferus) in full bloom, from tree grown in his garden and irrigated. Several members reported that they had failed to get this plant to grow on their farms without watering, and expressed the opinion that the natural moisture was insufficient for the requirements of the tree. Mr. Neumann also showed saltbush indigenous to the district which made good summer feed for stock.

Poultry.—The Hon. Secretary read a short paper giving his experience in poultry keeping, and showing that a few well-selected fowls, properly attended to, gave profitable results.

Auburn, August 17.

Present—Messrs. W. R. Klau (Chairman), E. M Dudley, S. Ford, J. B. Schober, and Dr. Yeatman (Hon. Sec.).

Manures.—Discussion took place on the results obtained from various manures tried by the members. The Chairman mentioned that he had best results from Thomas' phosphate on red clay land.

Colton, August 12.

Present—Messrs. P. P. Kenny (Chairman), W. A. Barnes, W. L. Brown, M. S. W. Kenny, W. P. Packer, W. McElder, A. S. Bartlett, R. Hull (Hon. Sec.), and one visitor.

Receiving Store, &c. A much-needed convenience in this locality is a receiving store at the Elliston Jetty, and steam communication is also required. Attempts to secure these aids to progress, recently made, have failed. Enquiry was made as to where a dynamo for testing machinery up to 1 ton could be purchased, and price for same.

Agricultural Instructor.—Members desire to have visits by practical instructors on agronomical subjects.

Crimson Clover.—Mr. W. J. Packer read a paper on the value of crimson clover as a nitrogenous renovator of the soil. He regarded the result from the use of fertilisers with cereals, recorded by the various Branches, as being not altogether convincing, and thought that, without analyses of soils and fertilisers, it would be difficult to decide what to apply; and, owing to the diversity in character of soils of the West Coast lands, it would be too costly to have them all analysed. He did not know, for certain, that crimson clover would grow on West coast lands, but it was well known as a nitrogen-gathering plant, and was serviceable also in feeding from stock. The question arose, is it possible to find a leguminous plant that can be grown along with cereals without interfering with the growth of the latter, but which will at the same time enrich the land by gathering nitrogen. [Whilst it is very improbable that crimson clover would thrive on the West Coast, owing to deficient rainfall, there is the possibility that Black Medick (Medicago lupulina), or some of the medicks, would do well there. In some parts of India the Black Medick grows regularly in the wheat fields together with the cereal, and it is stated that no nitrogenous manures are ever used. But the wheat crops are very light there.—GEN. SEC.]

Gawler River, August 16.

Present—Messrs A. M. Dawkins (Chairman), J. Hillier, J. Barrett, A. Bray, R. Badcock, F. Roediger, J. S McLean, T. P. Parker, H. Roediger (Hon. Sec.), and three visitors.

FALLOWING.—Mr. Badcock initiated a discussion on this subject. He found that in most cases early fallow gave the best results. He ploughed about 5in. deep and harrowed; in September he cross-cultivated with the scarifier, using 6in. shares set close together to cover all the ground. About three weeks later he cross-cultivated it again with chisel harrows. As a rule land worked to a fine tilth produced a better crop than if left in a rough state; but no hard and fast rule could be laid down. Both the variations in soils and seasons must be studied. Members considered that 10in. scarifiers did better work than 6in. when there were many weeds. The Chairman stated that he once ploughed in a heavy crop of straw on drifting soil when fallowing, and this proved effectual in holding the land. Mr. Barrett had a similar experience with stinkwort. Mr. F. Roediger had prevented land from drifting by working it in ridges, removing every other tine of the scarifier. Mr. Hillier had ploughed land roughly for the same purpose with good results. The Chairman said the earlier scrub land was fallowed the better, but where there is a stiff clay subsoil, it is better to wait a little later. On "Bay of Biscay" land some members stated it answered to fallow dry in summer and allow it to remain fallow through the year. The Chairman had better results from land ploughed for fallow after a heavy summer rain than from similar land fallowed late in spring, when the ground was dry and hard.

Cradock, August 19.

Present—Messrs. R. Ruddock (Chairman), P. Gillick, J. H. Iredell, Jas. Clarke, W. H. Haggerty, J. Paterson, T. Fitzgerald, J. H. Lindo (Hon. Sec.), and two visitors.

FORESTRY.—A discussion took place on the necessity for reserving portion of the Mattawarrangala run, known as Rocky Waterhole Paddock, as a forest reserve. It was stated that there were many thousands of young pines growing there, which would, if protected, become in a few years very valuable. The locality was also suitable for gums and other timber trees. It was decided to ask the Government to reserve the paddock in question from selection, as in the near future timber for fencing, sheds, &c., would be very scarce in this locality unless energetic efforts were made to conserve the young timber.

Finniss, August 7.

Present—Messrs. T. Collett (Chairman), H. Langrehr, W. W. Heath, and S. Collett (Hon. Sec.).

Treatment of Cows During Calving.—The Chairman read a paper on this subject. The following are the principal points:

The natural position is with the head and forefeet first, head on top of the legs and back upwards. Nature will do all that is necessary in this case, except with small cows, when a rope or strap may be affixed to the front feet of the calf, and a gentle pull (always downwards) will cause delivery. Unnatural positions require aid. When the tail is presented first, press the haunches back with the hand, take hold of the hough of one leg, pull at it and reach the foot, bring it into the passage, obtain the other foot in like manner, pull on both and delivery will follow. When the fore legs are presented without the head, place a light line on the feet and push them back; feel for the head (with a light line in the hand), try to fix the line on the jaws of the calf, and gently draw the head forward into position with the legs, then proceed as in the first case. There is considerable difficulty sometimes in this case, and it requires a long arm and very gentle movement. When the calf comes belly upwards, head over one shoulder, and fore legs first, push the feet back, turn the calf back upwards, if possible, bring the head forward over the fore legs, and proceed as in the second case. When the fore feet come first with head under the brisket, push the calf back, put the hand down between the fore legs and bring the head on top of the legs, and deliver. When the head alone, or one foot and the head, are presented, push the calf back, search for the foot or feet, bring them forward by putting the hand under the knee, and use gentle pressure until brought into the proper position in the passage; then proceed as in first case of natural delivery. Never pull a cow about much until after having ascertained that the calf is in its right position, and wait until the pains are on the cow before trying to take the calf away, except in cases of dead calf.

Bute, August 22.

Present—Messrs. E. Ebsary (Chairman), A. Schroeter, H. Schroeter, M. Stevens, R. Commons, J. H. Barnes. W. H. Sharman, and M. Hall (Hon. Sec.).

Business.—The business was chiefly of a formal nature It was arranged that each member should prepare a paper during ensuing year, at least one paper to be taken at each meeting.

Crops.—Mr. Barnes said that on land which was manured and cropped last year, and drilled with seed only this year, had gone yellow; whilst crop on adjacent land, sown broadcast this year, but drilled with manure last year, was darker in color. [What kind of manure?—Gen. Sec.] Members thought it not advisable to use the same kind of manure on land for two successive years.

Strathalbyn, August 21.

Present—Mr. M. Rankine (Chairman), Hon. J. L. Stirling, M.L.C., Messrs. B. Smith, D. Gooch, G. Sissons, A. Rankine, R. Watt, H. H. Butler, W. M. Rankine, P. Cockburn, W. J. Tucker, and J. Cheriton (Hon. Sec.).

Agricultural Implements.—The Chairman read an instructive paper on this subject, in which he traced the progress in agricultural machinery during his experience as a farmer; from the single swing plough to the multi furrow stump-jump implements; the flail to the stripper; the sickle to the mower and binder, &c. These various improvements, many of them due to the inventive genius of South Australian mechanics, enabled them to produce wheat very cheaply. He considered our small returns due very largely to bad cultivation. Their aim should be to put in a smaller area in better condition than in the past. He was amongst the sceptics who doubted the benefit of applying 56lbs. to 80lbs. of fertiliser with the seed drill; but his experience had convinced him that the practice would lead to largely increased returns. He was also a strong advocate of the use of the binder, and, with small areas, believed it would pay to use it altogether instead of the stripper. Early fallowing, especially in the drier districts, was another important matter. They must fallow well and fallow early. He preferred two and three furrow ploughs to larger ones, as he considered they did more effective work. The improvement in harrows of late years had been very marked. He was specially struck with the harrows with teeth that can be set back or forward, according to the requirements of the soil. He considered that, taken altogether, South Australia could grow wheat as cheaply as any other country, and paid a tribute to the value of the Agricultural College. As examiner in practical agriculture he could testify to the thorough teaching the students received.

Naracoorte, August 12.

Present—Messrs. S. Schinckel (Chairman), H. Buck, E. C. Bates, J. Wynes, F. A. Wittber, G. Wardle, O. Hunt, B. S. Roach, A. Johnstone, H. Smith, and G. Greenham (Hon. Sec.).

CODLIN MOTH.—After a long discussion, it was unanimously agreed, "That it is the strong opinion of this Branch that the Act should not be repealed."

DISEASES IN STOCK.—Mr. Wynes said a cow had been slaughtered by order of Inspector Williams for being affected with cancer. The Chairman said another cow, also near Naracoorte, was affected with tuberculosis. Some of the members thought it would be well if the Inspector would report cases of disease to the Branch.

AGRICULTURAL SHOWS.—Mr. E. C. Bates read the following paper:—

Any observant visitor to our local shows must admit that they are almost a *fac simile* of the preceding one, wanting in novelty and deficient in an educational sense. Granting this to be the case, would it not be wise to abandon a number of shows now held in the South-East, and form a society to be called the "South-Eastern Agricultural Society," to include the principal townships in the South-East, holding a show of three or four days' duration, movable annually. Mount Gambier, being the premier town, should have the honor for the first year; the second year, say Naracoorte; and each town consecutively until all within the confederacy have had the location of the show. It would be necessary for the interested bodies in these places to concentrate their energy, consolidate their funds, and combine exhibits, to make one grand comprehensive show—attractive, interesting, and instructive, worthy of this the most important district in the colony, and (like Tennyson's brook) going on for ever. By so doing prizes could be given and honors conferred that would attract exhibits and visitors from all directions. We would have nearly all the latest inventions and manufactures in agricultural machinery and implements, and have practical lessons by trial of same. We would attract some of the best stud stock in all classes, which at our annual shows are conspicuous by their absence. In fact, the novelties and general surroundings would be a revelation compared to present-day arrangements We have fairly good roads, a convenient and reasonable train and steamer service, to facilitate the transit of exhibits and visitors; also, the bicycle made for two or more. Compare these fast and comfortable conveyances with those in vogue when our local shows were in the embryo state, when the bullock and the horse were about the only power of locomotion, the journeys slow, dangerous, and uncertain. The age at present is rapidly progessive. Are we not going to try and pace with it in some degree? What was suitable for the grandsire is scarcely up to date for the grandchild. Federation has pervaded the political atmosphere for a number of years, and in all probability within a few years it will be an accomplished fact. With its advent our troublesome border barriers will be a thing of the past, and free uninterrupted passage each way allowed, which certainly ought to enhance the probability of successfully building up this society; and, when federated, we can expect Melbourne and Western Victoria to be exhibitors to a large provincial show. Independent of the importance of an annual show, such a society ought to be able to accomplish infinite good in preventing the introduction of diseases and pests, and make its influence felt by attempting to eradicate those from which we suffer. It could also be the medium for introducing almost every kind of novelty. [Mr. Bates then quoted from a speech by Mr. Walter Long, M.P., at a meeting of the Royal Agricultural Society of England, showing that, in regard to the healthy state of their herds and stocks, and the general work accomplished, they could with confidence and pride say that they occupied a position which was not occupied by any other country in the world.] Our Bureau has done good work and the branches could be quite as effective in becoming auxiliaries to such an institution. Our local agricultural societies are practically defunct during the recess, and nothing is done by them (except holding a show) to advance agronomy. If combined, we could have a permanent official who could devote the whole of his time in collecting and disseminating information for the whole district. Therefore let us become the pioneers in this needed reformation. There will be many obstacles to be overcome. Probably the most formidable will be vested interests and local jealousy. The first can't be fairly adjusted; the second can be smoothed down with a brick.

Mr. Bates said the Royal Agricultural Society of England held circuit shows alternatively in various parts of England; but the Chairman thought the circumstances of England and the South-East were altogether different. In England there was a large and dense population, while in the South-East the people were widely scattered, without easy means of transit. Mr. Wynes said one of the chief drawbacks to a combined show was the absence of sufficient fixtures, and it would be very costly to provide them Mr. Hunt showed that the latest Royal Show, held at Maidstone, resulted in a loss of over £2,000. The buildings for the show had to be moved from place to place, at great cost. If such a show failed to pay in England they could not expect success in such a thinly-populated place as the South-East. Mr. Hunt was for continuing in the old groove. Their shows were mostly for sheep, and they had exhibits that could compare well with anything penned in Melbourne or Adelaide. After deal more talk the discussion was postponed.

PEACH APHIS.—Mr. Greenham read a letter (printed in a newspaper), from Mr. J. Jennings, in which he recommended the use of bandages around the trunks of peach trees, to be smeared outside with a sticky mixture, made with venetian turpentine. castor oil, and resin, melted and mixed. The aphides crawl up from the roots and get stuck on the mixture. [It is a good plan to kill the aphides on the roots by baring them of soil for about 9in.; then swab with a solution and decoction made with 3ozs. of soap and 3ozs. of waste tobacco, boiled in 1gall. of water The aphides on branches can best be killed by covering the whole tree with a tent and fumigating inside with tobacco smoke. Sticky bandages are excellent for preventing the aphides climbing, but useless when the insects are on the branches.—GEN. SEC.]

HOW TO PROVE BLUESTONE.—Mr. Hunt said there were great complaints about impure bluestone, and referred to the simple test published by Mr. A. I. Woodhead, of the Agricultural College, Lichfield, and fully described in report of Boothby Branch meeting in the August issue of the *Journal of Agriculture.*

Onetree Hill, August 18.

Present—Messrs. J. Bowman (Chairman), F. Bowman, G. Bowman, F. Barritt, A. Adams, J. Hogarth, E. Ifould, W. Kelly, E. A. Kelly, P. Taylor, A. Thomas, and J. Clucas (Hon. Sec.).

HORSE-BREEDING.—Mr. Hogarth read the following paper on this subject:—

The best bred and soundest are the best for all kinds of work, and there is not nearly enough attention paid to the selection of mares for breeding purposes, more particularly on stations where great numbers are bred. If sheep and cattle were bred with as little care, how soon we would have a lot of mongrels, not worth the grass they eat. Nearly all the station owners when starting breeding horses have bought up all sorts and conditions of mares. No attention paid to their soundness: the only thing was would they rear a foal. The consequence is the herd starts with spavin, curly hocks, ring bones, &c. What wonder so many horses develop unsoundness of feet and limbs before they are seven or eight years old—just when they should be at their best—and, in consequence, are unfit for hard work for the remainder of their life, whereas they should do good work up to sixteen years of age at least. I have known several horses do hard work up to twenty-two years of age. Of course, those are exceptional; but that should be the rule, and for any under seventeen or eighteen years not being able to do hard work should be the exception. How very few really sound good horses do you see in a mob picked for market from any of the largest breeders. How difficult it is to get, say, two in one hundred about alike that will make a real good pair. Now, if instead of as at present breeding from all the females, they were culled yearly in the same way in which all the best breeds of sheep and cattle have been built up, in time a more uniform and even stamp would prevail, and unsoundness be the exception.

Any young man who is a good judge of horses and has capital who cared to take some of the abandoned sheep runs would do well if he were careful, as indicated above. Of course, to start a horse station by itself means considerable outlay, and there can be no return for about five years; consequently, it requires to be started in conjunction with sheep or cattle. Sheep are preferable, as they return something the first year. Really good, sound, shapely horses will always sell at profitable prices.

Judging Horses at Shows.—This would be better done by one paid professional than as at present. Frequently one sees unsound horses getting prizes at shows. Even at the agricultural show in Adelaide I have seen horses with spavin hock take a first prize The judges evidently did not notice the defect, and it is a very serious fault. For the benefit of those who may not know when a horse has it by any outward sign, looking at the hock it is quite easy to detect it when the animal is trotted round. When very bad the horse will drag his toe on the ground, and on hard road, if not protected with a heavy toeclip, wear the toe away; and when trotting round you will observe the animal so affected hitch up at the hip, to enable it to clear the ground with the toe, because it cannot bend the leg sufficiently at the hock to enable it to clear the ground with the toe. And also at shows you will see the first prize horse, a real good one, well deserving the prize, and the one which gets the second prize nowhere approaching the first prize one; but the judges in their mercy or ignorance give it a second prize. Now, this is not as it should be, because for one who knows a really good horse from an indifferent one there are fifty who do not know, especially when the animal is loaded with flesh. The consequence is that the fifty who do not know are guided by the opinion of the judge, and they say this or that horse took second prize to such another, who is renowned for having taken first prizes all over the country; consequently they think he must be a good horse, and should he travel in their district they put their mares to him, and get a long-backed bad-actioned foal, or with some other defects. Therefore, judges should give their judgment fearlessly and fairly, not thinking in what way it is going to affect the exhibitor; and they should also put in writing why they do not give a certain horse a prize By so doing the exhibitor and those concerned would know why the horse did not get an award. Horses should be judged by points, and if they did not have a certain number for each part, should not get a prize. That would soon prevent entires from travelling when not fit to breed from.

Breaking in Colts.—Some seem to think if a man has plenty of bull-dog courage, and can stick to anything he can get a saddle on, that he is a good coltbreaker. But I prefer a man who is not too good a rider, whose judgment predominates, and who commands his temper. Very often those bull-dog plucky men have so much bad temper that it quite controls the judgment. One of the best coltbreakers I ever have seen was a sailor who could not ride "a little bit," as they say often in the bush. I have seen many mistakes in colt-breaking; for instance, a sulky colt I have seen thrashed unmercifully and dragged about an hour and more, and the coltbreaker rabid with rage because the colt would not give in Now the remedy for a sulky colt is very simple. When you find you have caught a sulky one do not flog or knock it about in any way. but simply tie him up to a post: tie him as high on the post as possible, 6ft. or 7ft. up, with the rope passed under his chin between the chin and a saddle strap, or other suitable strap, which connects the two rings of the bit, and fasten the rope round the colt's neck, tying the rope a bowline knot, so that it will be easily unloosened when required. The reason for keeping the rope under the chin is to prevent it getting over his poll and choking him, and the reason for tying high up on the post is to prevent him being able to pull hard enough to hurt himself. When he pulls, the rope inclines to lift him off his front feet; consequently he cannot pull hard enough to hurt himself or to break the rope, and it is only a question of one, two, or three hours until he will have got rid of the sulks, and will be quite willing to move without unnecessary whipping. Sulky colts make fair workers. When once broken in they will always require tying back to prevent them doing more than their share. And, again, you will often hear a horse called a jib, as if the horse was born that way; for one horse which is naturally a jib there are a hundred made jibs by bad drivers. For one man who knows how to break in and work horses there are fifty who do not know. Very often they will load a colt too heavily and stick him up. The consequence is he is never as good as if he had been loaded lightly until he is quite used to the work, and has taken light loads over all the bad places he will be required to go. So many good horses are spoilt by the bad judgment of the loader or driver. You will often see the slow horse in the team driven out of his pace to keep up with the faster ones; consequently he soon begins to show signs of over work. But a reasonable man would keep back the faster ones to the pace of the slow ones, and get more work out of his team than the one who is always whipping up the slow horse.

Feeding.—Some put too much feed in the feed box at a time, and the consequence is that the horse picks out the best and blows his nose over the rest, and will not eat it. One requires to find out about what his horse can eat at a meal, and not put more in the box until it is cleaned out. Horses are something like human beings—they can do and do well on less than they can eat. For real hard work I dare say oats and chaffed hay is the best feed. I prefer soaking the oats—the horse will chew them better than if fed whole and dry.

Shoeing.—Every farmer should have a small forge, and shoe his horses when required. It saves a lot of time. Many shoeing smiths do not appear to understand how to shoe a horse which brushes. They invariably keep the shoes of the foot which strikes towards the outside of the foot, and rasp away the hoof on the inside, which is a mistake. Many horses can be so shod that they will in time not brush The shoes should be kept to the inner side of the foot of the leg which is struck, and the outside rasped down the most, which will cause the pastern joint to cant outwards, out of the way of the striking foot.

Shying Horses.—Often you will see a driver or rider of a shying horse punish him for so doing, which is the very worst thing to do. Punishment will never cure it; it will make them worse, and may cause a serious accident, as he may shy at an awkward place on the road, and expecting to be punished bolt as well, and may be over some siding or against a fence. If you want to cure a shying horse you must, if you see that he is likely to shy, stop him beforehand, and let him have a good look at the object of his fear, and, if possible get him coaxed up to smell it, and in a little while he will rarely shy. The horse appreciates kindness, and can detect in the voice of his driver if he is angry with him. They are fond of their home, and if they get a chance will make back to where they were bred, even after many

EXHIBIT.—Mr. Barritt tabled seven sorts of apples and two of pears in excellent preservation. They had been laid separately on clean straw.

HORSE COMPLAINT.—Mr. Hogarth said he had lately purchased a horse upon which a little active exertion had a strange effect. It gasped, writhed, and appeared to be in an agony of distress. When taken out of harness it would roll and soon recover its normal condition. Another horse had suffered similarly, but soon recovered after having discharged some pus at the nostrils.

SOWING WHEAT.—The experience of members has shown that Professor Lowrie's recommendation to sow early-maturing wheats late and late-maturing sorts early is well worthy of consideration. Mr. Hogarth had sown King's Early with superphosphate early in the season, and it had come into ear prematurely. Seed, however, which had been sown at the same time with bonedust was not so forward, and promised a good crop.

Mount Gambier, August 12.

Present—Messrs. J. Umpherston (Chairman), J. Watson, J. C. Ruwoldt, G. G. Collins, W. Barrows, J. Dyke, W. Mitchell, M. C. Wilson, T. H. Williams, and E. Lewis (Hon. Sec.).

EXPERIMENTS.—Mr. J. Jacobs, head teacher, Point Schanck Public School, wrote asking members to assist him in carrying out experiments on his agricultural plots. He specially desired to obtain new varieties of potatoes. Mr. Ruwoldt promised to let him have a few potatoes if possible.

Gladstone, August 5.

Present—Messrs. J. King (Chairman), J. Brayley, J. H. Rundle, B. Griffiths, C. Gallasch, D. Gordon, C. R. Phillis, J. Shephard, J. H. Sargent, J. Milne (Hon. Sec.), and one visitor.

FIELD TRIALS.—It was decided to recommend that the Bureau Field Trial Society go into recess for twelve months. The action of the importers in arranging not to take part in these trials has rendered this necessary.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year seven meetings had been held, with an average attendance of nine members. The annual Conference of Northern Branches was held at Gladstone, on February 17, and proved very successful. The Dairy Instructor had visited the district, and much valuable information on dairy matters was elicited from him. The Branch had secured the loan of a pure-bred Jersey bull from the Department. The retiring officers were thanked for their services. Mr. C. Gallasch was appointed Chairman, and Mr. Milne re-elected Hon. Secretary. A vote of thanks was accorded to the local corporation for use of the council chamber.

Bag of Chaff.—Considerable discussion took place on the question of having a standard weight for the bag of chaff. Members were opposed to the 40lb. bag.

Manures.—An interesting discussion took place on the various commercial fertilisers. One brand of English super. was condemned as being too damp to run through the drill properly, resulting in the crops being patchy. Bonedust was too slow in its action. One member had applied well-rotted stable manure to twenty-five acres, but it was, in his opinion, simply waste of time and labor.

Stockport, August 21.

Present—Messrs. D. G. Stribling (Chairman), C. W. Smith, S. Smith, T. Megaw, J. F. Godfree, F. Watts, J. Smith, J. Smith, jun., and J. Murray (Hon. Sec.).

Railway Freights.—The General Secretary wrote that the question of reduction of railway charges on fertilisers and implements could not be discussed at Congress, as the Bureau had no power in the matter, but suggested that those interested should arrange with their parliamentary representatives to wait upon the Railways Commissioner and bring the matter under his notice. The Hon. Secretary was instructed to secure the co-operation of as many of the delegates at Congress as possible, and carry out the suggestion of the General Secretary.

Branch Picnic.—It was decided to hold a farmers' social and picnic in connection with the Branch on September 20.

Quorn, August 19.

Present—Messrs. R. Thompson (Chairman), John Cook, J. B. Rowe, G. Altmann, F. Herde, W. Toll, C. Patten, J. Johnson, H. S. Stacey, G. Baker, and A. F. Noll (Hon. Sec.).

Tomato Disease.—Mr. Altmann read a short paper on this subject. It was frequently noticed that, just when the tomatoes should be ripening, some of the bushes showed strong greenish flowers, and the green tomatoes will show signs of cracking. On plants very badly affected the few early fruits when ripe will, on careful examination, show signs of roots amongst the seeds. Often the fruit fails to set, or drops off when small. Over-watering is sometimes blamed for this trouble, but he doubted whether too much or too little water had anything to do with it, as, in a number of plants treated exactly the same, a few here and there are affected, while the others bear fruit all right. He put it down to inferior seed. From one lot of seed he purchased over two-thirds of the plants were affected. [The description of the trouble is not too clear. Over-watering or over-manuring will frequently cause the failure of the flowers to set fruit. The flowers turning green is probably due to the seed running out, owing to too much in-breeding. This trouble is frequent in cultivated flowers, and is generally considered to be due to continued propagation from the same strain, which has been weakened by excessive production of flowers and fruit. —Gen. Sec.]

Most Profitable Animals.—An interesting discussion took place on question suggested in *Journal of Agriculture*—Which is the most practically useful and profitable animal on the farm? Five voted for the cow, and six for the horse. It was considered that although no direct return was received each week from the horse, as is the case with the cow, it was practically absolutely necessary to cultivate the land to provide corn for the fowls and pigs, and hay for the cow. Some members thought they could manage some cultivation with the cow, and make butter at the same time.

Lucindale, July 29.

Present—Messrs. E. Feuerheerdt (Chairman), A. Matheson, E. Hall, W. Dow, J. Bourne, A. Lobban, B. Feuerheerdt, E. E. Dutton (Hon. Sec.), and two visitors.

Codlin Moth.—It was decided to support the protest of Penola Branch against the repeal of the regulations prohibiting the sale of codlin moth infested fruit.

Grass Grub.—Members reported that in several places a small white grub, working in the ground, was destroying considerable areas of grass.

Exhibit.—Mr. W. Dow tabled specimens of rope made from waste binder twine and from stringy bark.

Hard Udder.—Chairman asked for remedy for newly-calved cow with hard udder. Mr. Lobban recommended washing with warm water, and rubbing in olive oil.

Aphis.—The Chairman read the following paper on this subject:—

"The life history of the aphis is a varied and interesting one. The cycle of its life may be said to begin in autumn with the laying of the eggs. These eggs are deposited either under the cover of the leaf or fruit buds, on the roots of the tree, or under any litter, &c., at the trunk of the tree, at the first approach of the cold weather. At the end of winter these eggs are hatched, and produce the first brood, which consist of perfect, fully developed, viviparous females—that is, females capable of producing their young alive. This brood goes through the usual forms of grubs and chrysalis, but there is no great difference of form between the three successive stages, and these stages are passed through very rapidly. This first brood is generally winged, and being ready fertilised on leaving its birthplace, a single insect is capable of forming a colony wherever it alights. The insect puts its proboscis or sucker into soft bark, leaf, or bud, and sucks at the succulent juices, and in an incredibly short space of time begins to put forth her young by a peculiar process of budding, almost as a tree puts forth its leaves. This is continued at an astonishing rate, and as her brood increases she moves on, taking a suck at every fresh spot, and so continues. Now this brood, unlike its mother, is wingless, and does not go through the grub and chrysalis stage, but, like its mother, at once begins its sphere in life by inserting the sucker and drawing nourishment from the tree, and also in an astonishing short time begins to bud out young. These again are ready formed to continue the same process, and so this budding process continues as long as favorable weather and the food supply continues. But at the first approach of cold weather in autumn winged males are produced, and mate with the females, who then give up the budding process, and in place thereof proceed to lay eggs, which, as I mentioned at first, are deposited on the fruit, on leaf buds, on roots, &c., where they lie dormant during the cold weather. The egg-laying generation is thus shown to be merely a device for meeting the severity of the winter months, and the scarcity of the food supply in the succulent juices of the tree, which are likely to be lacking during the dormant season. The fact of the brood born from the eggs undergoing the usual metamorphosis of insects proves that the aphis in its present type is but a degenerate species of an active free-flying family of insects, developing by evolution into sedentary habits by too great an ease of obtaining a living.

Knowing the life history of the insect, the methods of checking their increase can be better understood; and as this is the time of the year when we may expect to see the first brood appear, extreme vigilance must be used to check and destroy this brood. I will briefly add a few hints as to the best means to apply towards this end. Firstly, clear away all litter, &c., from beneath the tree, and burn it. Secondly, remove the earth from around the trunk, laying bare the crown of the roots. Into this hole pour a kerosine bucket of soapsuds, into which a small cup of kerosene has been added, and well stirred. The stirring should be continued until ready to pour into the hole. This could be repeated two or three times. If the insects should appear on the branches, the parts affected should be either brushed or sprayed with kerosene emulsion or tobacco wash. Tobacco wash is made as follows:—1lb. tobacco waste, ½lb. to ¾lb. soft soap, and 4galls. water, well boiled together. Kerosine emulsion:—Take 1pt. of water, add 1oz. hard soap. When the soap has dissolved bring it to a boil, take off the fire and add 1qt. of kerosene. Then churn violently, which can be done with a large syringe, or if put into a closed vessel well shaken until a cream-like emulsion is formed. This is the stock solution.—For use, take one part of the emulsion and add to five parts of water.

Mr. Hall said he bared the roots of apple trees badly affected with aphis, and used hot lime freely with goods results.

Eudunda, August 22.

Present—Messrs. C. Wainwright (Chairman), A. Pfitzner, H. Hage, A. Kluske, F. W. Paech, C. L. E. Lutz, W. Krummell, H. D. Weil (Hon. Sec.), and one visitor.

THE AGRICULTURAL BLOCK.—Mr. Kluske reported on the different varieties of wheat grown on the block last season. He had since ploughed, cross-ploughed, and harrowed it; also applied sheep manure and superphosphate, with the intention to grow several kinds of holcus and sorghum on it for summer fodder.

Inkerman, August 15.

Present—Messrs. D. Fraser (Chairman), W. Board, C. H. Daniel, W. Fraser, G. Peter, and W. A. Hewett (Hon. Sec.)

HARROWING *v.* ROLLING GROWING CROPS.—This question was well discussed, and it was resolved that soils vary so much that it is not possible to fix any hard-and-fast rule; but, generally speaking, harrowing is much preferable. Mr. Board thought the chain harrow is best, but is not sure that it will work amongst stumps.

GRUBS.—The Chairman attributes abatement of the grub pest to frost.

Mount Compass, August 19.

Present—Messrs. M. Jacobs (Chairman), S. Athurs, R. Cameron, C. S. Hancock, A. J. Hancock, W. Wright, R. Peters, H. McKinlay (Hon. Sec.), and two visitors.

CALENDAR FOR MONTH.—Plant onions, carrots, parsnips, beet, and field peas. Prepare land for potatoes.

PRODUCE OF THE DISTRICT.—A discussion took place on the returns from land in this district, in connection with proposal for a line of railway from Adelaide to Willunga. After careful consideration members estimated the output of onions and potatoes from this district would be nearly 1,300 tons, in addition to other produce.

Mallala, August 23.

Present—Messrs. H. B. Moody (Chairman), G. Marshman, S. Temby, A. F. Wilson, F. M. Worden, J. McCabe, M. H. East, J. Jenkins, A. Moody, G. W. Bischof, W. R. Stephenson (Hon. Sec.), and two visitors.

FORESTRY.—On July 23rd Mr. A. Molineux, F.L.S., General Secretary, gave a public address on forest culture. He strongly advocated the planting of trees for timber, shelter for stock, for beautifying the neighborhood, and specially referred to the effect of forests on the climate. He condemned the practice of simply digging holes in which to plant the trees. The whole of the land intended for planting should be deeply ploughed and well worked. This applied to fruit as well as forest trees. Discussion took place, and was continued at the August meeting. Mr. Wilson advocated planting from May onwards; the plants should not be too small. The Chairman advocated the establishment of a nursery in the district. Mr. Marshman had not had much success with trees he had planted until last year or two. In planting sugar gums in bamboos he stripped off nearly the whole of the bamboo, and out of one planting of forty, thirty were growing. He thought trees might well be raised at the Roseworthy College for distribution in the drier districts surrounding. He considered it paid to plant trees for timber. Mr. Worden grew his own trees. Seeds were sown in small tins without bottoms in January, and set out the plant in August and September. Mr. Bischof had very good success with tree planting. Mr. McCabe advocated fallowing ground intended for planting. Work it similarly as for wheat, and set the trees about 9ft. apart. This method was generally approved by members.

Mannum, August 18.

Present—Messrs. J. G. Priess (Chairman), J. A. Schulze, W. Kowald, R. Heidrich, G. Lenger, C. Pfeiffer, J. W. Walker, J. Nickels, F. E. Schuetze (acting Hon. Sec.), and two visitors.

WHEAT.—The Chairman reported that in digging out rabbit burrows he had followed roots of wheat to depth of 30in. He thought this deep rooting accounted for the manner in which the wheat resisted the effects of drought. Mr. G. Lenger reported that some of the early crops had been injured by the severe frosts.

CO-OPERATION.—Discussion on this subject was resumed, and the conclusion arrived at was that co-operation does not always pay in small communities, and that if the cash system were introduced, it would, now competition is so keen, answer better in the country than co-operative efforts.

Dawson, August 12.

Present—Messrs. R. Renton (Chairman), S. Chapman, C. W. Dowden, C. F. W. Just, C. C. Kid, C. H. Meyers, O. Muller, A. F. Dempsey (Hon. Sec.), and four visitors.

PLOUGHSHARES.—The Chairman reported that Messrs. Jas. Martin & Co. had forwarded him one dozen new ploughshares for trial. He had distributed these amongst the members. He had tried some himself, but found they did not give anything like so much wear as Forgan's shares, though they were much cheaper. The Hon. Secretary said he had used one each of Martin's, Forgan's, and Keipert's shares in the same set, and tabled the worn stumps, showing the first named gave nothing like so much work as the others. Considerable discussion ensued, and the members agreed that the cheap share proved the dearest in the long run.

FALLOW.—An interesting discussion took place on "How to Work the Fallow." It was generally agreed that fallowing should be done as early as possible, and finished before the grass begins to dry. After-cultivation should be avoided, except to obtain the proper tilth and destroy weeds. If the land is caked or ridgy scarify before sowing, to get a fine even seed bed. Sow about 40lbs. per acre, more or less, according to the size of grain or nature of land. Stiff clay land requires more seed than free loam. Some members suggested keeping sheep to eat off the weeds instead of cultivating, as the land will not bear much working. being usually so dry that it becomes fine and dusty. In such cases sudden heavy showers, which are not infrequent, wash a lot of soil away, and beat down the rest until it is like a road. Other members contended that it was useless keeping sheep where the average farm does not exceed 700 acres, and the pasture is so poor that it requires fifty acres to feed a horse.

Port Broughton, August 22.

Present—Messrs. R. W. Bawden (Chairman), R. Storr, J. Harford, J. Bates, W. R. Whittaker, E. Dalby, B. Excell, E. Dennis, and J. Barclay (Hon. Sec.), and one visitor.

Papers at April Conference.—In answer to an inquiry from this Branch the General Secretary replied that he had not received manuscripts or reprints of the papers read at the Conference of Northern Yorke's Peninsula Branches held at Port Broughton in April last. The members resolved, "That in future no papers in connection with this Branch be handed to Mr. Taylor, of the *Wallaroo Times*, because in the past Mr. Taylor had not returned the papers, as promised."

Fowl Houses.—Mr. Storr read a paper on this subject, with illustrations, which will be published separately later on.

Angaston, August 19.

Present—Messrs. J. E. Swann (Chairman), W. Sage, R. Player, A. Sibley, A. Friend, J. Vaughan, P. Radford, F. Thorne, E. S. Matthews (Hon. Sec), and one visitor.

Windbreaks.—Diverse opinions prevailed concerning windbreaks for orchards and vineyards, some members contending that they are beneficial, others holding the opinion that the trees take more from the ground than they return in the way of increased productiveness of the orchard or vineyard through the protection afforded. [By digging a trench between the shelter belt and the orchard or vineyard. and cutting off the trespassing large roots, all "robbery" by the shelter belt can be prevented.—Gen. Sec.]

Currants and Raisins.—Mr. A. Sibley read the following paper:—

The Zante currant is different in several important respects from almost all other varieties. Three distinct kinds of Zante are known, and are distinguished by color of the fruit, which in one is white, in another red, and the third (which is the most important of the three) black. The bunches are large, or at least above the medium size, while the berries are very small. The black variety has its berries of an elongated shape, and not only small, but seedless. The reason for this peculiarity has never been definitely ascertained, but it is believed by the native growers of the Grecian Islands to have arisen from the fact that the cuttings from which the variety was first propagated came from very old vines.

The intending grower of currants ought to take special note of the quality of soil which he intends to plant. If the currant vines are put into deep alluvial soil, it is possible that he may have no returns for nine or ten years; but if there is limestone subsoil at no great depth, the vine will come to maturity much more quickly, and he may bring his vines on so as to get a crop in the fourth or fifth year, but it will neither bear so well nor for so long on this kind of land. On good deep soil the currant crop will be the heaviest, and will be all the better if the ground be not too dry, so that plenty of nourishment may be provided for the luxuriant growth of the plant. The currant ripens a good deal earlier than those which are adapted for raisins or other kinds of grapes; and, in favorable localities, it will sometimes be found possible to get them dried quite three weeks before other kinds are ready.

The drying of currants takes only a very short time if the sun be fairly hot, and it is usual to reckon on about four to seven days as being the time required.

The very long style of pruning which the plant requires marks the Zante vine off from all other varieties. There is, perhaps, no other kind of vine for which very long pruning is so specially adapted; the rods which are to grow the fruit for the ensuing year should never be cut to shorter lengths than about ten or twelve buds, and on rich deep soil so vigorous is the growth of the vine that it will stand, without injury, bearing year after year, with even longer pruning than this. Owing to this style of dressing, rather an extensive trellis should be provided for its growth: the uprights should be 4ft. to 5ft in height, with the cross pieces put on the uprights so as to make the shape of the letter T; two wires held by the uprights, and a couple by the cross pieces, will then enable the vines to make the vigorous long growth which is natural to them.

In growing grapes for the purpose of making raisins it is necessary to remember that sun-drying is not only a great source of economy, but also of excellence in the product. It follows from this that if in any locality a particular variety of grape will not ripen sufficiently, it is not so suitable as others which may be chosen for raisin-growing. In some high and cool situations such grapes as the Muscats will not ripen early enough to enable the grower to take the advantage of the hot weather of February and March for drying purposes. There are some seasons in which dry winds and warm sunshine continue up till the end of April, and even into May, but it does not do to rely upon these exceptional cases; and, at any rate, seeing that there are other products—such as currants—which are specially suited for situations of this description, it is a mistake for any grower in high and cool localities to go into a line in which he is handicapped, when he might take up one in which, on the contrary, he has the decided advantage.

The best districts for raisin-growing are those in which the Muscats ripen by February, or even earlier. The localities for pursuing this industry will be found in the land bordering upon the River Murray and the lakes, especially those portions upon which irrigation could be done. It is found that, with the forcing and stimulating effects of irrigation, the raisin grape will come to maturity three weeks or a month earlier than without such artificial assistance. It matters not in what part of the country in which irrigation is done, whether it be north or south, high or low, the bringing of the grapes to maturity will always be possible if the land can be artificially watered.

A deep and alluvial soil will give a heavy crop, but to retard its ripening, while warm and not too deep soils bring their crop to maturity much earlier than alluvial flats or gullies, and perhaps it would be best to say that deep alluvial soils and cool districts will not suit so well for raisin-growing as other soils and situations which are more favorably disposed for the early ripening of the grapes. It has been found that on those deep rich soils, where raisins have been tried, they have been too backward in some seasons to dry completely in the sun before the weather changed, and they have to be dried in kilns.

In cultivating the grape for raisin-making, a good description of soil is that of a gully with a limestone subsoil, the ground sloping slightly, but well worked so as to hold the rain. There are several kinds suitable for this purpose, Muscat of Alexandria, Sultana, and the Muscatel Gordo Blanco. The Sultana raisins have some of the peculiarities both of the raisin and the currant; it is seedless, and furnishes the well-known Sultana raisin of commerce. The grape is a pretty berry, of an amber color, and rather small size, nearly the shape of an olive, and the vine requires very long pruning, because the shoots nearest the stem are quite barren, and a trellis would be necessary. It is a vigorous grower so far as leaves and shoots are concerned, but unfortunately, unless planted in favored situations, gives very little fruit. The Muscatel Gordo Blanco is, on the whole, the favorite, and is a good and reliable bearer; it requires very short pruning.

Sun-drying is the best method of drying. The method of sun-drying is very simple. The bunches should be dipped in a boiling lye made for the purpose, and then placed on wooden trays, and set out in convenient places, and left for ten or twelve days, or as long as may be necessary until they are thoroughly dried.

In some parts of the best raisin-growing districts bordering on the Mediterranean, the growers do not even go to the expense of having trays made, but merely have drying ground, prepared by smearing it with cowdung, and on top of this surface they throw out the bunches. Stiff brooms are made of twigs and used for cleaning the dried berries off from stalks, and the raisins are packed in barrels.

Riverton, August 19.

Present—Messrs. H. A. Davis (Chairman), W. Hannaford, D. Kirk, J. Kelly, T. Gravestock, M. Badman, F. M. Calf, and H. A. Hussey (Hon. Sec.).

CODLIN MOTH.—After some discussion it was resolved that this Branch hopes that the Government will not relax the regulations in relation to the destruction and spread of the codlin moth.

Norton's Summit, August 19.

Present—Messrs. James Jennings (Chairman), A. Smith, J. Hank, J. Pellew, and W. H. Osborne (Hon. Sec.).

VISIT TO ROSEWORTHY COLLEGE.—Members thought the issue of tickets to visit the College at show-time should be regulated, so that producers should not be prevented from going owing to persons not connected with the producing interest occupying the limited conveyances available.

COLD STORAGE OF FRUIT.—The Chairman read report of experiments made by the Kent County Council on storage of fruit.

Nantawarra, August 21.

Present—Messrs. C. J. Herbert (Chairman), J. W. Dall, A. F. Herbert, C. Belling, James Nicholls, R. Uppill, A. L. Greenshields, S. Sleep, R. Nicholls, and T. Dixon (Hon Sec.).

LAKE DEPOSITS.—Arrangements were made to try to secure the reservation of portion of the salt lake to enable farmers to obtain portion of the deposits of mud, &c., for use as a fertiliser.

FIELD TRIAL SOCIETY.—Delegates reported arrangement for field trial of implements near Paskeville, in October, in connection with the Bureau Field Trial Society.

Balaklava, August 12.

Present—Messrs. P. Anderson (Chairman), W. H. Sires, J. Vivian, E. Hams, G. Reid, A. Hillebrand, A. W. Robinson, E. Roberts, W. Crawford, W. Smith, and E. M. Sage (Hon Sec.).

LICENSING STALLIONS.—Mr. Smith read a paper on this subject. When he first looked into this matter it appeared to him to be too arbitrary, and too much like interfering with the liberty of the stockowner and agriculturist to compel owners of travelling stallions to pay a licence fee. Upon second thoughts, however, it is very evident that the breeding of sound stock, free from hereditary complaints, is the first consideration of the stockowner, consequently it is necessary that the Government or some local authority should have some control over all stallions travelling for hire, and that only such as are found to be constitutionally sound should be allowed to travel; of course, if a person owning a stallion does not allow it to serve other mares than his own, he should not require to pay any licence fee. A limit should also be put on the fee charged for service, and also on the number of mares served. If this were done they would have a much better class of horses, and healthier, as he believed most of the chronic complaints their horses suffered from were inherited from the sire. The Bureau should try to impress on the local Agricultural Society the necessity for withholding awards from any horse not passed by the veterinary. Several members stated that the Balaklava Society tried this plan eight years ago, but it was not satisfactory. Mr. Robinson considered the farmers had only themselves to blame for the weedy horses they raise. A good horse at a reasonable price could get no patronage if a cheaper horse of any description was available. He agreed with Mr. Smith. Mr. Hillebrand opposed, as he considered he should be allowed to do as he liked in the matter. [So you should, as far as your own stock are concerned, but you have no right to impose unsound horses on others who are ignorant of their defects. Licensing of stallions would not interfere with a man breeding any class of horses he liked, in fact it would help him to obtain his end. Most breeders desire sound horses, and it certainly would not be an obstacle in his way if the Government said no one should take a fee from him for any stallion that was not sound.—GEN. SEC.] Several members supported Mr. Smith, and Mr. Roberts thought the Government should extend the operation of the principle they had adopted by purchasing pure-bred bulls, and obtain a few good draught horses. Several instances were given of the ill effects of over-using stallions in the desire to obtain as much money for their services as possible. With the exception of Mr. Hillebrand, all the members agreed that it would be a good thing for the country if a workable scheme for licensing stallions could be adopted.

Mount Bryan East, August 19.

Present—Messrs. W. Bryce, H. Wilkins, W. Quinn, E. Prior, J. Honan, T. Wilks, R. Webber, T. Best, J. Prior, W. Dare (Hon. Sec.), and two visitors.

BONEDUST.—Mr. Wilkins stated that about fifteen years ago he gave some salt or alkali patches a dressing with bonedust, and though no result was noticeable the first year, there was a good return the next.

STANDARD BUSHEL.—Members all agreed that as they were docked for all wheat under the standard weight for the season they should receive an extra price for wheat over the standard, also that the farmers should be represented in the Chamber of Commerce, when the standard average weight of the season's wheat is fixed.

OFFICERS.—Messrs. T. Wilks, E. Prior, and W. Dare were elected Chairman, Vice-chairman, and Hon. Secretary respectively for ensuing year.

Yorketown, August 19.

Present—Messrs. J. Koth (Chairman), A. Jung, C. Domaschenz, J. Latty, and John Davey (Hon. Sec.).

ANNUAL REPORT.—There were nine meetings held during last year, the attendances being very scanty. It was decided to be strict in respect to persistently absent members, and to fill their places with gentlemen who will attend.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

Golden Grove, August 17.

Present—Messrs. T. G. McPharlin (Chairman), S. A. Milne, J. R. Stuart, J. Woodhead, A. Marr, F. Buder, A. Robertson, R. Smith, and A. Harper (Hon. Sec.).

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

ANNUAL REPORT.—Ten meetings were held during the past year, with average of eight members. Several important matters had been discussed and useful papers read, including "Dairying" and "Horse Breeding."

JUDGING HORSE STOCK.—Mr. Woodhead read the following paper:—

Probably one of the reasons why our horse stock has decreased in character of late years is due to want of proper judgment at our agricultural shows. In the earlier days of the colony we had men as judges of horse stock who were thoroughly competent, such as Friend Cleggett, Robt. Smith, James Duncan, John Harvey, Wm. Ferguson, J. Jepp, and some others, who maintained quality in our prize stock. But when the Northern Areas were opened up about thirty years ago, men of all classes took up farm lands and fancied they knew all about horse stock, and from that time horse stock continually depreciated in character. These men began to breed horses, and soon commenced to act as judges at shows, giving prizes to anything that showed plenty of beef and that was decorated with pretty ribbons. There has been much talk about licensing stallions, but it would be better to license the judges. Everyone who wishes to act as a judge should first be examined by a committee of qualified men, who should test his ability to judge by a practical illustration. He should be able to point out all defects, and give the age of the animal up to seven years. If he can do all this, give him a certificate entitling him to judge at any show or elsewhere. Another reason for deterioration is that country agricultural societies allow first prizes for the best on the ground, as they want to encourage competition. This leads people to show anything for a prize; but no judge should award first prize to a second-class or inferior animal.

Members were agreed that some of the judges have been partly responsible for deterioration of horse stock, but there are other causes. The low prices prevailing have offered no encouragement to breed from first-class horses, and owners and breeders do not take the pride in their horses that used to be felt by early colonists. Farmers want to get their work done cheaply and expeditiously, and appearance is a secondary consideration when it costs too much. Mr. Woodhead did not favor single judging, as one judge might be able to discover defects which another could not detect. Members would be pleased to learn that the principles of judging live stock were added to the curriculum of the Agricultural College. [This has always been one of the subjects taught at the Agricultural College.—GEN. SEC.]

Watervale, August 14.

Present—Messrs. E. W. Castine (in chair), S. Solly, H. Scovell, H. Beck, C. Castine, B. Perrin, W. Smith, and E. Treloar (Hon. Sec.).

POULTRY.—In a long discussion on poultry Mr. Scovell considered the Minorca by far the best for laying, and when crossed with the Langshan they make splendid all-round fowls. Messrs. Beck and Scovell have lately introduced the Indian Runner ducks to this district.

RED SPIDER.—Several members stated that the red spider had done much damage, and are very difficult to deal with when they get amongst culinary vegetables.

Robertstown, August 23.

Present—Messrs. N. Westphalen (Chairman), J. Armstrong, A. Day, W. Mosey, T. Hagley, H. Rohde, A. Rohde, F. Fiedler, J. E. Milde, S. Carter (Hon. Sec.), and two visitors.

WHEAT BAGS.—Several members are of the opinion that the large-sized wheat bags are not approved of by the majority of farmers, but others consider that the system of four-bushel bags is not likely to be superseded.

PIG COMPLAINT.—Mr. A. Rohde had a pig die. It staggered, walked backwards, ran its head into everything. He wished to know what was the complaint and the remedy. [The Chief Inspector of Stock states this may have resulted from a severe attack of worms. The pigs should be given 1drm. of sulphate of iron once a week for a few days. A good supply of wood ashes should be placed in the pens.—GEN. SEC.]

Belair, July 21.

Present—Messrs. O. Nootnagel (Chairman), C. Downer, W. J. Bartlett, George Wescombe, J. Halstead, and George R. Laffer (Hon. Sec.).

PEACH APHIS.—Mr. Bartlett stated that he had found peach aphis on several of his trees. He successfully got rid of the trouble by means of tobacco and soap wash.

Peach Curl-leaf.—Mr. Bartlett read a lengthy paper on this subject, quoting largely from bulletin by Professor Atkinson, of the Cornell University, and from paper read by a member of another Branch. The following is an abstract of the paper:—

This is a subject requiring, in the opinion of many, careful observation and experiment. It is generally stated to be caused by a fungus growth which is destroyed by spraying with Bordeaux mixture. While not prepared to contradict this entirely, he was equally unprepared to accept it as the complete panacea of the curl-leaf evil, as to his mind reliable evidence as to the efficacy of Bordeaux mixture is wanting. Evidence as to the best remedy or remedies are anxiously wished for. The fungus said to be the cause of leaf-curl, as it is called in America, is one of a large genus bearing the family name of Exoascus. They are parasitic on the genus Prunus and attack different parts of different members of that genus, deforming leaves in some (peach) fruit buds and leaf buds and twigs of others (various plums); in fact, no part of the plant, in one or other of the prunus, is safe from this family of fungi except the roots. Some members of this family or genus of fungi spread by spores, by which a new infection takes place each year. Others, as Exoascus deformans, have a perennial mycelium, and a new infection each year is secured by the mycelium, which winters in the tissues or buds of the host as well as by spores. With all the genus of Exoascus the first marked appearance of their active presence in the tissues of the host is the stimulus to an increase in the number or in the size of the cells so that characteristic malformations of the diseased parts appear. In the leaves, when attacked, the increase in the number of the cells of the diseased portion causes that part of the leaf to arch upward or downward in a series of irregular folds.

Mycelium.—In this species, Exoascus deformans, and in fact in all but one, the mycelium penetrates to some depth in the tissues, but it is always intercellular. It is very irregular in its course, and forms an irregular chain without order between the cells of the host. The mycelium may be quite abundant in some species, so that when the cell walls and intercellular substance of the host are dissolved out it presents a very intricate network of threads.. In parts where the mycelium is passing the winter (as in the buds of the peach), it is more scanty and frequently consists of isolated cells.

Hymenium.—From the interior of the tissues of the plant the mycelium grows to the surface (of the leaf). They make up what is called the hymenium, and become developed in such numbers that eventually they are closely crowded. Each hymenium elongates or grows perpendicularly to the surface of the leaf and becomes divided into two cells. The lower, or inner cell, is the stalk cell, and the upper, or outer, is the ascus or fruiting cell. In each ascus there are developed a variable number of spores, usually four or eight. At maturity a perforation usually occurs at the apex of the ascus, and the spores are ejected with considerable force. The foregoing remarks are correct of the whole genus Exoascus generally. To refer more particularly to Exoascus deformans, or leaf-curl. The mycelium is perennial in the leafy buds, that is it passes the late summer, autumn, and winter months in the tissue of the leaf buds, and in the following spring grows out with the developing leaf, multiplying more abundantly in certain portions than in others at times. This accounts for the fact that the whole area of the leaf is not at all times affected. The persistence of the mycelium during the autumn and winter seasons in the leaf buds is probably the chief cause of the spread of the disease. When buds are taken for budding young seedlings in the nursery, if they are taken from an affected tree, the disease is quite sure to be transmitted to every young tree which is started from a bud which contains the perennial mycelium. Since all the affected leaves fall off from diseased trees at quite an early period, and at the time of budding there is probably no sign of curl in any of the leaves, it would be impossible to discriminate between the diseased and healthy trees, or affected and free branches. Professor Atkinson (of the Cornell University Ago. Exp. Station, Crvptogamic Botany), whom I have so extensively quoted, goes on to say—"Some experiments have been made in various places by spraying the trees with Bordeaux mixture for the prevention of the leaf-curl of peach trees. Some experimenters regard it as certain that the disease can to some extent be checked by this method. It is quite likely, in some cases at least, another disease is confused with the leaf-curl, and this fact might account in those instances for the results claimed. More definite experiments, with an accurate determination of the diseases present, should be made before too much can be claimed for the efficacy of sprays for the prevention of this trouble." He would like to refer to an article which appeared in the Bureau *Journal* for May of the current year, p. 821, on curl-leaf. From what is known of Exoascus deformans, it does not affect the fruit and cause it to drop, and I would ask the experience of members. Some of the genus Exoascus do affect the fruit, but it is not Exoascus deformans, and not the peach affected by it. He had no doubt we are, in this article referred to, given an altogether different disease. In conclusion, Professor Atkinson states—"It is to be regretted that definite and conclusive experiments have not yet been made concerning the treatment and control of the diseases caused by the various species of Exoasceæ, so that the information which is most desired by fruitgrowers could be confidently placed before them. It is hoped, however, that a greater familiarity with the characteristics caused by this group of parasitic fungi will lead to a more intelligent experimentation. It should be remembered that the species possess a perennial mycelium which lives in the buds or branches of the trees during winter of plants which once have become infected. That a tree once affected is likely to show the disease more or less every year. Climatic conditions probably influence a greater or less injury from year to year, so that in some years little of the trouble may be observed, when in other years it is more common." This variation of the quantity of its appearance has caused many, I think, to credit Bordeaux mixture with the result, and not climatic conditions affecting the fungi. This fact also has caused some to think that the fungi are not perennial, but that a fresh infection each year is caused by spores only. This is a mistake. There is abundant evidence, from the results of several investigators, to show that the mycelium is perennial, for it has been found during the winter months, and in the spring has been traced as it grows from the buds or branches into the young leaves or fruits.

Professor Atkinson several times tried to inoculate healthy peach trees or unaffected ones from the spores taken from freshly-matured specimens on affected trees. Not only were the spores sown on the young leaves and buds, but pieces of the leaves containing mature spores, and others containing the mycelium only, were inserted into a slit in young buds and in the young branches near buds. In no case did any sign of the disease appear, even after three years. Several of these incisions were wrapped with moist cloth, and kept moist for several days, while in other cases a moist chamber was made around the twig by covering it with quite a large test tube. He says—"I know of no successful experiments made in inoculating trees with spores. From these experiments we are forced to doubt the efficacy of spraying. Where the disease is ascribed to fungus growth and watched microscopically for several years doubt is thrown on Bordeaux mixture. That there is a fungus present on deformed leaves some will admit, but declare that it is not the cause of the disease, but the disease affords the foothold for the entrance of the fungus." Certainly the difficulties Professor Atkinson and others have had to inoculate healthy buds, leaves, &c., support this theory. It has been observed by many curl-leaf inevitably follows cold winds (easterly) in the early part of the season. The tree is a native of a warm climate; it is blessed with an abundant sap. When this abundant sap is beginning to flow upward and pass through the leaves for elaboration and evaporation a cold wind occurs, and, acting on the leaves, prevents these functions being carried out, and the leaf becomes swollen and congested.

Neilson, of Victoria, said that after thirty years' experience, and trying every remedy known, he had to confess that he could not cure it. He had been assured by more than one gardener that they had neither seen nor heard of curl-leaf in a hot-house in England. A peach growing in a peach-house and then removed outside has been known to not take curl for two years; but a peach whose root was in the house and stem and branches trained on the wall outside took no curl-leaf. These facts are worthy of consideration, and possibly the attempt to reconcile spraying as a cure absolute will end in difficulty. One Victorian grower confidently asserts that he has conquered the leaf-curl difficulty. Aphis trouble him more than leaf-curl. He kills two birds with one stone, to my mind. His remedy is to spray when the buds are opening and prune afterwards. If it is fungi, Bordeaux mixture is there; if it is the congested and diseased leaf having superabundant sap through receiving a check by cold winds, well, the knife at so late in the season permits bleeding to an extent sufficient to restore the health. Certainly, many cases have proved to be benefited by pruning as late as possible.

His own impression, after much study and consideration of the question, is that the fungus Exoascus deformans is the effect of the disease, not the cause. Weakness, sickness, or an unhealthy state is first produced in the tree, and then the fungus appears We notice curl after cold days that have been preceded by a few warm and pleasant ones. The circulation of this superabundant supply of sap sent up by the peach root is arrested; then, if you like, would the fungus appear on these now sickly leaves, unable in the decreased temperature to elaborate the amount sent up.

According to Thomas Moor, F.L.S., Curator of the Chelsea Botanic Gardens, the climate of England and America is uncongenial to the peach, and in England they are worked on the plum. He says he has seen peaches so worked growing so perfectly in accordance that after a number of years scarcely any inequality could be detected at their juncture. In his revised edition of peach curl he says, "It is occasioned by cold, and there is no cure." It has been stated that worked on the almond peaches are less liable to curl. He could refer to one garden where several peaches are worked on plum stocks, what kind the owner cannot say now. The peaches immediately around these in season may be seen often badly affected with curl, but those on the plum stocks are scarcely affected with either curl or aphis. He says he would use more of the plum stock only that it has too great a dwarfing effect.

[Note by Mr. G. Quinn.—All the scientific investigators who have studied the "curl-leaf" disease of the peach (Exoascus deformans, Fucl.) microscopically agree that this species is mainly propagated and perpetuated by means of the perennial mycelial growths which remain upon the trees. The article referred to and quoted from in the *Journal of Agriculture* for May of this year was written by Professor Selby, Botanist and Chemist, Ohio Experimental Station, and detailed the results of spraying experiments conducted under his direction. These experiments were carried out after microscopic studies had revealed and verified all the facts respecting the life history of the disease quoted from Professor Atkinson by the writer of the foregoing paper, and the identity of the disease settled beyond a doubt His studies of the disease, combined with careful observations of the meteorological conditions prevailing during the times when the disease was prevalent or restricted, continued since 1892, point to the accuracy of his conclusions that showery weather accompanied by a low temperature during the time when the leaves were putting forth is very favorable to the development of the fungus.

In the spraying tests with Bordeaux mixture made upon the Elberta (a variety very susceptible to the disease) it was found each succeeding year the treated trees showed a lessening number of diseased leaves, while upon the unsprayed trees of the same variety used as checks the seriousness of the attack was intermittent each year with the varying conditions of weather. Professor Selby has concluded that the spraying had a cumulative effect in repressing the development of the perennial mycelium, and consequently resulted in a lessened number of the resting hyphæ being present in the buds each year. According to Professor McAlpine, the Victorian Vegetable Pathologist, the "curl-leaf" present here in South Australia is identical with the disease known in Europe and America by the name of Exoascus deformans. The fruits of nectarine affected by the curl-leaf have been found in isolated instances, and the young sappy twigs are often attacked on the peach. The manner in which the disease usually affects the fruits is in an indirect sense, that is by reducing the vitality of the tree at a critical period, thus stunting and often causing great numbers to fall off the trees. The leaves fall from the trees when the fungus has intergrown their tissues and broken down their powers of assimilation. It is opposed to all the teachings of vegetable physiology to say that this temporary and almost complete cessation of assimilation does no harm to the tree or the fruit. The theory that cold easterly winds prevent assimilation and evaporation will scarcely bear investigation, as it is well known that unless the leaves are cooled down to freezing point, a most unlikely contingency here in September, these functions do not cease. If the leaves are frozen assimilation and evaporation would cease, and so would all circulation; consequently congestion and swelling would not occur, for when a portion of a leaf is once completely frozen it is of no further use and perishes. If the inflated condition of the leaves is caused by sap pent up on account of the plant's respiratory functions having been suspended, why is it that the second strong crop of leaves which emerge, when the first crop has absolutely dropped off, do not "curl," as the plant has received in that case a direct check when its vegetative functions have been in full activity.

Owing to the varied susceptibilities of different sorts of peaches, the mere statement of plum stocks being of value is not a reliable test unless tried alongside the same sorts worked on their own roots. I think it is generally accepted that nearly all lower forms of parasites, whether upon plants or animals, await the moment of weakness on the part of their respective hosts to make their attacks felt. A cold wind, causing rapid evaporation and a consequent low temperature, followed by a deposit of the necessary moisture, may at a critical time check the vitality of the peach tree. This, supplying the necessary conditions, gives the the germs (perennial mycelia) of this disease their opportunity. If Bordeaux mixture will prevent the growth of these, then it is worthy of use, whether the fungus causes originally or follows upon and intensifies a debilitated condition of the leaves. Whether the fungus makes healthy peach trees weakly or weakly trees more debilitated does not concern the ordinary grower. What he wants to know is how to mimimise the evil, and in this colony quite nine-tenths of the peachgrowers who have used Bordeaux mixture upon the trees each year since 1892, when the buds are opening, are satisfied that it does prevent to a very great extent the damage caused by the Exoascus, and are also satisfied to continue to use this fungicide.]

Mylor, August 5.

Present—Messrs. W. Nicholls (Chairman) P. P. Probert, W. H. Hughes, E. J. Oinn, T. J. Mundy, E. Wilson, W. J. Narroway, W. G. Clough (Hon. Sec.), and nineteen visitors.

CO-OPERATION.—Mr. E. Wilson read a lengthy paper, of which the following is an abstract:—

Co-operation has many phases, and its objects are multitudinous. One object is to so direct the flow of wealth at its source that its distribution may be equally and equitably effected. Its effect is to remove many of the disadvantages from which producers and consumers suffer under the competitive system The question arises "Can we with advantage start a Co-operative Society in this place?" Circumstances here differ from those affecting distributing societies in large towns in England, or even in South Australia, where the constituents have simply to form what is practically a company, take up shares, employ a number of persons to buy and distribute the various articles which they consume, and divide amongst themselves the profits. Circumstances here are different; we do not work for wages, or live in rented houses. Our conditions are old-fashioned; we have received from the Government portions of land on which we may make our homes, and from which we seek to obtain by our own labor, without the aid of capital, those necessaries and comforts which others obtain by selling their labor to others. We expend our labor on the means of production to which we have access, and retain the profits for ourselves. With most of us our labor is our sole capital, and it is imperative that our labor should be expended in the most advantageous and economical way. This can best be done by co-operation; but we cannot wait until some perfect scheme is brought before us, though we may take up one part of the subject at once, and adopt other portions gradually as the way opens. Here are a few of the ways in which we can apply the principles of co-operation. First, there is the purchasing and distribution of the food which we cannot produce ourselves. The number of such articles could probably be much reduced, but still there are many such; and there are many articles beside food, such as building materials, commercial fertilisers, implements, tools, fencing wire, domestic animals, &c. These things are not purchased in such a way as to give us the most for our money. If we could club our cash and buy in larger quantities they would cost less. Secondly, the method of getting those goods to the various homes is very wasteful of time and labor. Several persons, horses, and vehicles are employed in doing the work of one; and several journeys are made in obtaining small quantities where one journey would suffice to get them in bulk All this could be avoided by the establishment of a co-operative store; and, of course, the nearer to total adhesion to the store, the greater would be the benefit.

There are many articles which we could make for ourselves (instead of buying) by co-operation, such as soap, candles, olive oil, pickles, sauces, blacking, bacon, butter, cheese, dried and preserved fruits, jams, &c. All boots and shoes, and wearing apparel, socks, straw hats, &c., harness, vehicles, ironwork, doors, sashes, &c., could be made amongst ourselves, and requires no dear capital or expensive machinery, and should be entered upon at once.

In regard to charcoal, firewood, posts, rails, palings, &c, the cost and labor of preparing, carting to the railway station, and disposal could be much reduced by all working together. Then as to fruit and vegetables, is it necessary that so many men and youths, with horses and drays, should take a twelve hours' journey, and lose their sleep three times a week, each taking down a part of a load, when a distributing agent at our own depôt could manage the whole business? This locality is likely to become one of the best apple-growing centres of the colony, and by co-operating we should be in the best position to meet the requirements of the export trade, and to deal with any surplus by drying, preserving, &c. Instead of buying fruit-trees we could save money by establishing a nursery, and raising fruit trees and garden seeds true to name, and suited to our climate and conditions.

Next, a labor bank might be formed. Suppose forty residents place at the disposal of themselves collectively one day's work in the year for each year, each member would be under obligation to give thirty-nine days' labor during the year, and also be entitled to receive the help of thirty-nine of his fellow-workmen during the year. Then, suppose a member wished to quickly clear a piece of land of scrub for a cow, he could claim the assistance of the thirty-nine others in two or four or eight instalments, and at as many different times. Then a loan bank could be started. If forty persons would deposit one shilling each per week, £100 would accumulate in one year, and would be available as small loans for a short time, repayable in instalments. For the more rapid development of the interests and prosperity of the settlement it might be worth while to borrow some of the "stored-up labor" of the world in the shape of hard cash. Say that each of the 100 blocks at present comprised in the settlement devoted five acres to apple trees, and the owners borrowed £10,000 at 5 per cent., in ten years they would have paid £5,000 in interest and owe £10,000, equal to £15,000. At the end of ten years the annual value of the fruit should be £10,000, less interest, £500, leaving £9,500 to be divided amongst the 100 owners of orchards, or £95 each.

Nothing in these propositions would interfere with the individualism of the blockers, and we cannot afford to neglect consideration of the subject.

Mr. Wilson reported that three meetings had been held in connection with this matter, rules had been drawn up, and a public meeting was to be called on August 12th to inaugurate the society, if possible. [At the meeting on August 12th eighty shares were taken up, and there seems to be every prospect of the co-operative movement being successful at Mylor.—GEN. SEC.] Mr. Wilson was heartily thanked for his efforts in this connection.

SOILS.—Mr. H. R. Antuar forwarded a paper on this subject, which was read, and the author thanked.

Elbow Hill, August 22.

Present—Messrs. E. Wake (Chairman), F. J. Brooks, J. Elleway, W. Spence, H. Dunn, J. Rehn, C. L. DuBois, C. J. Ward, W. Ward, G. Wheeler (Hon. Sec.), and nine visitors.

SORE SHOULDERS IN HORSES.—The Hon. Sec. read a paper, of which the following is an abstract:—

Sore shoulders are often the result of neglect or carelessness, though no one can prevent galls or small sores occasionally, but these should never be allowed to become so bad as they sometimes are. The principal cause is scald, through being over-heated. Horses should never be worked too hard during sultry weather. Scald is often caused by badly-fitting and badly-stuffed collars, too wide at the part bearing on the shoulders, and generally too soft. It should be rounded, so as to let the air under, and the harder the better, if smooth. The most difficult sore shoulder to heal is that caused by too much corn food, and the best cure is a spell on grass. To cure a sore shoulder, double up the leg of an old moleskin trouser three or four times, and tack on the collar above and below the sore, and treat the sore with Osmund's cattle oil or dry salt, after bathing well with warm water. Never cut the collar. This treatment will cure an ordinary sore shoulder in a week or two.

The Chairman thought the chief cause of sore shoulders is the shape of the shoulder, which is too sloping in most of the so-called draught horses, which are only riding horses, without the pace or action of roadsters.

TUBERCULOSIS.—The Chairman and several members consider that efforts should be made to have all cattle inspected by competent men, and any animals destroyed if found to be diseased.

Burra, August 25.

Present—Messrs. F. A. S. Field (Chairman), Jas. Scott, W. Heinrich, F. Duldig, Hon. J. Lewis, M.L.C., and R. M. Harvey (Hon. Sec.).

"THE FORGE ON THE FARM."—Mr. J. Scott read a paper of which the following is the substance:—

Force of circumstances compels farmers to use every idea tending to economical working of his holding. Twenty or thirty years ago, few farmers felt competent to work at a forge, but now there are very few economical farmers who do not use the forge and necessary tools, and who do most of the work that would never have gone to the blacksmith had they not possessed those appliances. "Live and let live," is good in theory; but the smith in many cases would be better off without the petty jobs that can be done on the farm, because the man who fails to study economy, by sending every little item to the village smithy, is often obliged to run up a long account which has to remain unpaid until he gets a good harvest. Instead of putting his hand constantly into his pocket to pay for little items, the economical farmer sharpens his own harrow tines, coulters, steel or malleable shares, &c., straightens bent scarifier tines, bolts, bars, and so on, and thus saves a lot of time in going to the smith, as well as a little money on each job. "A stitch in time saves nine," and working with strained machinery, twitched up with a piece of fencing wire does not pay. Although at first, the inexperienced may burn and spoil his work, he will soon learn how to avoid such disasters. Blacksmithing is not a difficult matter, and there are very few secrets attached to it. There is no secret in welding two pieces of iron together. Keep the fire clear of ashes and clinker, blow up the fire into working order, thin down one edge of each piece of iron, then blow away until white-hot, lift smartly out of the fire, place them together, and hammer until they cannot help sticking. Nearly every farmer shoes his own horses, and to do this successfully he must have a forge. Many horses are crippled through ill-fitting shoes; it is therefore most important to have the shoes fit properly. To do this, first level off the sole of the foot by removing the superfluous horn with a toe-knife and hammer (an old shear blade makes a very good substitute for a toe-knife). Level off the foot with a rasp if it is crooked or pigeon-toed, put it into as good a shape as possible by rasping off projecting edges, then shape the shoe to the foot, leaving it a little wider, and about the same length. Next use the hot shoe and the farrier's knife to make a proper bed for the shoe, which cannot be made without a forge. There are far more horses' feet ruined by badly-fitting shoes than by bad nailing on, though that is a very important item. To procure the forge and tools costs a little at first, but no one who has once got over the initial difficulties would not do without them for double the money. Fencing wire and green-hide gives way to more substantial work, and the farmer is surprised to find he is a better blacksmith than he thought he was.

Port Lincoln, August 18.

Present—Messrs. W. Laidlaw (Chairman), D. Bruce, J. Telfer, J. O'Shanahan, E. Chapman, and J. Anderson (Hon. Sec.).

Disc Plough.—Mr. Barraud said he had seen the Massey-Harris disc plough at work on Mr. Bruce's property at Poonindie, and considered it well suited for land which is not stony or covered with stumps. It would do good work on grass-tree land (yacka) after the yackas have been cut level with the surface, as the plough pulverises the soil well. If this should be the case many hundreds of acres could be turned into good grazing land for sheep or cattle, which at present carries very little stock.

Ploughing.—Mr. Laidlaw read a short paper. The following is the substance:—

If there is any farm work which requires to be done with greater care than another it is ploughing. The furrows should be fairly straight, well turned over, showing very little grass or weeds. This district was never famous for good ploughing, and, since the advent of the multi-furrow ploughs the work has certainly not improved. When a new make of plough comes out, which will turn more furrows than the last with less horsepower, it is generally admitted to be an improvement; but it is the implement that is approved of, and not the work done by it. He (Mr. Laidlaw) had always used either the single or the double-furrow plough, and had never seen any multi-furrow plough that could do equally good work. It was not always, however, that the ploughs were to be blamed for bad work, but those who were satisfied with such poor work. No doubt many of our farmers had never been taught how to plough, and are not, therefore, competent to show their men how to set and hold their ploughs, or how to put up a crown or make a good finish. With a good teacher it should not take long for a smart lad or man to become a good ploughman. The ploughman who cannot handle his team well will never make a first-class ploughman. The first lesson to be learned should be how to manage the team, and to do this kindly, then to set and handle the plough.

Kanmantoo, August 24.

Present—Messrs. W. G. Mills (in chair), T. Hawthorne, F. Lehmann, E. Downing, P. Lewis, H. Werner, A. D. Hair (Hon. Sec.), and one visitor.

Stock Complaints.—Mr. Mills stated that he had recently purchased several pigs from Adelaide. They were apparently quite strong and healthy, but after he had had them a few days they became sickly, and several died. On close examination he found them to be infested with ticks or lice. A member stated that several sheepowners had complained that their sheep were losing the wool along their ribs.

PASTURES.—A discussion ensued on this subject, and it was stated that the plant known locally as "Geranium" or "Poverty weed" was becoming a serious nuisance in the pastures, crowding out and destroying the more valuable grasses. It grows very close to the ground, and is consequently not readily eaten by stock. Members were of opinion that if the pasture land in the district was given a rest for two or three years, and the grasses allowed to seed freely, the benefit would be very marked. With drought and over-stocking, the pastures were in very poor condition.

HAND-THRASHED WHEAT FOR SEED.—The Chairman noticed that the portion of his crop from hand-thrashed seed was much thicker than that from machine-thrashed He thought this was due to the latter being more damaged by bluestone pickle, which destroyed more seed than most people thought. Hand-thrashed seed germinated better than that thrashed by the machine.

Port Elliot, August 26.

Present—Messrs. P. O. Hutchinson (Chairman), J. Nosworthy, H. Green, sen., J. McLeod, H. Pannell, W. E. Hargreaves, J. Brown, J. Davidson, F. T. Fischer, and E. Hill (Hon. Sec.).

BEST FARM ANIMAL—The Chairman initiated a discussion on the best all round animal on the farm, but no decision was arrived at.

PEACH APHIS.—This subject was mentioned, and Mr. Fischer stated that satisfactory results had been obtained by dressing the bared roots with lime.

HARROWING AND ROLLING.—In reply to question, Mr. Brown stated that sometimes he both rolled and harrowed his wheat crop, using first a heavy roller to break the clods, then harrowing, and rolling again with a light roller.

Lipson, August 19.

Present—Messrs. S. F. Potter (Chairman), J. Brown, J. McCallum, J. Wishart, H. Brougham, and one visitor.

WHEAT SACKS.—A discussion took place on the advantages of the two and four bushel wheat sacks. Members were of opinion that they can carry all the wheat they can produce in four bushel sacks.

Port Germein, August 26.

Present—Messrs. G. Stone (Chairman), W. Crittenden, W. Broadbear, H. H. Glasson, J. R. Gluyas, W. Head, D. Thomson, P. Hillam, W. Mortess, A. H. Thomas (Hon. Sec.), and W. Phillis, Chairman Mount Pleasant Branch.

FALLOWING AND DRIFT SAND.—Mr. Mortess read a paper on this subject. The question of the land drifting was a most important one in this district, where so much damage had been done. The scrub having been cleared, there is very little protection of either the fallows or the crops against the strong dry winds which are so prevalent. In his opinion working the light soils to a very fine tilth was largely the cause of the drift. He advocated fallowing to depth of 4in. to 6in. with a double-furrow plough, and leaving it in ridges as much as possible. This will cause the rain to soak in and prevent drifting to a large extent. For real drift sands all he could suggest was sowing during July or August with some fodder crop that would grow during the summer months and hold the land; the drawback to this course was the scanty rainfall. Mr. Deer said it was necessary for them to have their wheat lands clear. He advocated early ploughing, feeding off any weeds that may grow, and then plough deeply in spring. The Chairman thought if land liable to drift was ploughed opposite to the prevailing wind it would to a large extent prevent the trouble. Members generally attributed the drift to the dry weather and to the destruction of grass and roots through cultivation.

TICKS ON FOWLS.—The Chairman inquired best remedy for this trouble. Mr. Phillis advised application of Cooper's dip.

Clare, August 25.

Present—Messrs. J. Christison (Chairman), W. Kelly, J. Treleaven, W. Kimber, R. Graham, H. Carter, and H. J. Yelland (Hon. Sec.).

DISEASED PEAR TREE.—The Chairman tabled branch of Duchess pear showing small lumps on the bark, which appeared to be hollow. On being opened the inside was found to be of a spongy or pithy nature. Members could not suggest cause for this trouble.

KILLING GUM TREES.—Mr. Carter asked best time to destroy gum trees. The general opinion was that they should be ringbarked in January or February.

Minlaton, August 26.

Present — Messrs. J. McKenzie (Chairman), J. D. Mayer, W. Correll, M. Twartz, R. Higgins, J. Martin, H. Boundy, J. Bennett, S. Vanstone, Jos. Correll (Hon. Sec.), and two visitors.

FARMYARD MANURE.—Mr. Martin read a paper on "Farmyard Manure and how to apply it" to the following effect:—

Farmyard manure is generally used either green or fresh, when heated and perhaps slightly mouldy, or when rotted. He did not believe in applying it in the second stage, as it was dry and heating. He thought it better to apply it fresh, or at any rate as soon as possible after seeding. Cart it out and spread it from the dray, as it can be done more easily and more evenly than if tipped and spread. The land can either be fallowed or the manure left on the surface. In the latter case you get more grass and feed. The addition of stable manure at the proper time helps the soil to retain moisture. He did not know whether rotten manure spread as described would not give equally good results Besides stable manure there was much other fertilising matter on the farm available, such as pig and fowl manure, bones, ashes, &c., and he was of opinion that farmers could make a better fertiliser on the farm than they usually purchased. He thought they should make a shallow pit 3ft. to 4ft. deep, with good bottom. In this place a layer of stable manure, then all the bones they could obtain, crushing them first, then other manures; in fact, anything that would decay and enrich the heap. Wet the heap well and allow it to decay. They would, of course, have some trouble in drying it so that it would run through the drills, but he suggested that all the wood ashes should be carefully saved and mixed with it to dry it. If the heap was spread in the sun during the hot weather and turned a few times it would dry sufficiently to run through the drill.

Considerable discussion followed, several members agreeing that it was better to apply the manure fresh, as it was richer than if allowed to heat and ferment. One member favored piling up in heaps and allowing them to heat and the ammonia to escape (!) as seeds would be destroyed. It was agreed by all that it would be a good plan to have a shallow pit in which to place manure, bone, ashes, and other refuse. Messrs. Correll Bros. pointed out that phosphates had been found to give the best results with wheat, and it would be impossible to produce on the farm in the way suggested sufficient of phosphate for anything but a very small area. Superphosphate could not be made out of anything but a distinctly phosphatic material; even if stable manure proved good for wheat in their dry climate, they contended it cost more to apply it than it does to buy and apply commercial fertilisers. It was generally agreed that stable manure was better for hay or grass, but that for grain, commercial fertilisers were the only ones of practical use for the Peninsula.

PRESERVING WHEAT CHAFF.—A short discusssion took place on best way to preserve wheat chaff in good condition. Mr. W. Correll suggested a stone and iron roofed shed with good board floor. This would prove cheapest and best in the long run; a board floor was necessary, as they must have the air to circulate under the chaff, otherwise it would take up moisture from the soil and be damaged. A number of members favored stone and iron sheds for storing hay, &c., while others suggested covering the heap with iron, taking off the covering as the stuff was required for use.

MANURES.—Mr. W. Correll tabled wheat plants manured with Thomas phosphate, with Thomas phosphate and sulphate of potash, and with mineral super. The plant which received potash was much more robust than the others. Where potash and super. had been applied there was apparently no benefit from the potash. He thought it was probable that the potash had a beneficial effect on the phosphoric acid contained in the Thomas phosphate, making it more readily available for the plant.

Hawker, August 23.

Present—Messrs. A. C. Hirsch (Chairman), R. Wardell, J. W. Schuppan, H. M. Borgas, and J. Smith (Hon. Sec).

TOMATOES.—Mr. Schuppan advised sowing tomato seeds in well-prepared beds and giving the plants careful attention until they were strong enough to transplant. The soil for tomatoes required to be well manured and worked down fine.

GRUBS.—Members reported that grubs were very numerous. The Chairman said as far as he had noticed they were not doing any harm at present to the crops, but were destroying the weeds.

FARMERS' EXCURSIONS.—Considerable discussion took place on suggestion of Stockport Branch *re* farmers' excursion trains, but members could not see how the farmers would be benefited.

Brinkworth, August 18.

Present—Messrs S. Aunger (Chairman), A. L. McEwin, R. Cooper, Jas. Graham, J. F. Everett, A. W. Morrison, C. A. Horne, C. Ottens, J. Stott (Hon. Sec.), and two visitors.

PAPER.—Mr. Horne read a lengthy paper on "How to make the *Journal* a paying concern." The idea was that advertisements should be accepted from persons to be approved by Branches of the Bureau, and to be afterwards supervised by the General Secretary and Editor.

CHEMICALS FOR FERTILISERS.—Members wish to know can chemicals be imported for manufacture of fertilisers; and, if so, what proportions of each chemical would be required to be mixed for the manufacture of each kind of fertiliser. [Of course, chemicals can be imported; but, with the exception of bone superphosphate, extensive works and highly skilled, specially educated and trained men are needed for the profitable manufacture of commercial fertilisers.—GEN. SEC.]

RAINFALL.—Condowie, August, to date, 0·57in.; for year, to date, 8·24in.; last year, to date, 11·56in.

Morgan, August 19.

Present—Messrs. J. Jackmann (Chairman), E. Jacobs, R. Windebank, J. Bruhn, H. Hahn, G. Roedigar, and J. Wishart (Hon. Sec)

HARVESTING MACHINERY.—Mr. Hahn read an interesting article from the weekly press descriptive of the combined harvesting machinery used in California. Members freely admitted its advantages in saving straw and chaff, and handling the grain cheaply.

Arthurton, August 17.

Present—Messrs. W. Short (Chairman), W. Lomman, T. B. Hicks, J. Koch, J. Pearson, C. L. Palm, M. Baldock, W. H. Hawke, J. W. Parker, J. B. Rowe (Hon. Sec.), and eleven visitors.

VISIT TO HOMESTEAD.—This meeting was held at the residence of Mr. C. L. Palm. Members inspected the homestead and various improvements, special note being taken of the provision for water supply for household purposes in the shape of three underground tanks. After the meeting Mr. Palm entertained the visitors.

MICE.—Mr. W. H. Hawke initiated a discussion on the damage done by mice. The facts concerning these pests were that they were most destructive, and nothing came amiss in the way of food except materials they absolutely cannot get their teeth into; they breed very rapidly; are periodic in their visitations, and disappear as suddenly as they come. During the nineteen years he had been on the Peninsula there had been four of their visitations, and they appear to recur at intervals of four or five years. They are most troublesome in mallee country, the early farmers on plain lands not being much troubled. It is impossible to keep feed in good condition. He had put by feed for seasons of scarcity, but the mice had got in and made a mess of it, consequently, stock do not care to touch it. He thought they bred in other districts and migrated, increasing rapidly as they move on. They always seem to come from the north and never appear to travel to the north. He thought they bred in the mallee country in the splendid shelter afforded by the stumps, &c., and travel from the earlier districts downwards as feed gets scarce. During the long dry summers following on plentiful supply of food they increase rapidly. Wheat that shakes out and lays on the ground, unless there is sufficient moisture to cause it to grow, furnishes an abundant supply. When the food becomes scarce he believed they ceased breeding, eat one another, and disease resulting their numbers dwindle again. He suggested the use of poisoned wheat, flour, &c. Phosphorised wheat is very good. If placed around the paddocks, especially those being sown, it would prevent them from doing much damage to the crop. Plenty of cats should be kept. These will also prevent hares and rabbits increasing too rapidly. Sheets of iron should be built into the stacks, or put all round about 2ft. from the ground and extending some distance beyond the stack. This would prevent the mice getting to the tops of the stacks; he noticed they always seemed to work from the top downwards after getting into the stack. [Kill all the crows, magpies, hawks, and other birds which, live upon mice and vermin generally, and then the mice, &c., will increase rapidly. —GEN. SEC.]

Pine Forest, August 15.

Present—Messrs. W. H. Jettner (Chairman), W. Wurfel, A. Inkster, J. Phillis, and R. Barr, jun. (Hon. Sec.).

SEASON.—Great complaints were made of the damage to crops by the frosts and dry weather, and fears expressed that the returns would be worse than usual, owing to increased cost of seeding. Members were, however, much impressed with the superiority of the crops on fallowed land. especially those drilled in with superphosphate. The wheat is maintaining a vigorous healthy appearance, whereas on land ploughed up after harvest and broadcasted the majority of the crops are stunted and poor. With the results in view, it was considered an additional calamity that fallowing should be at a standstill, owing to the hardness of the ground.

EXHIBITS.—The Chairman tabled various samples of home manufacture, including churn, meat chopper, knives, &c., all of creditable appearance.

Mundoora, August 18.

Present—Messrs. W. Aitchison (in chair), T. Watt, G. Haines, C. Button, W. H. Mitchell, J. Vanstone, and A. E. Gardiner (Hon. Sec.).

USE OF MANURES.—Members would like to have the experience of members of other Branches as to the likely effect of super. upon seed when they remain together in the soil for several months before there is sufficient moisture to cause the grain to germinate; also whether, in such case, the super. would not have been rendered insoluble, and consequently of no more value than, say, Thomas phosphate Mr. Aitchison said he would like to see the Government pass a law prohibiting the sale of fertilisers under a certain standard, as is done with spirits and other articles, to prevent dishonest practices. It would not cost much to put such a law in operation, while it would be of great benefit to purchasers. Members heartily supported the suggestion, considering it would give better protection than the present law, as few farmers care to go to the trouble and expense involved in getting the fertilisers tested for themselves; besides which, they are, as a rule, exceedingly busy at the time they obtain the fertilisers. The Hon. Secretary suggested that where a number of farmers in one district are purchasing supplies they should combine and get one lot, and have the same tested in accordance with the Fertilisers Act. The expense of testing would be very small on each member, and if the analysis proved the fertiliser to be unsatisfactory the matter could be taken into court at their joint expense. He was confident if this practice was adopted they could rely on help and advice from the General Secretary. [This suggestion is a very good one, and if adopted purchasers would save considerably in rail freights and other charges. If purchasers will adopt the advice given in August issue of the *Journal of Agriculture* by the Inspector of Fertilisers, and insist on the guaranteed contents being shown on all orders for fertilisers, there will be but little opportunity for dishonest practices on the part of vendors. It is expected that this season the Inspector will be able to publish analyses of all brands of fertilisers on the market, so that purchasers will be able to compare these analyses with the guarantees of the vendors before they take delivery of the fertilisers.—GEN. SEC.]

FENCING TOOLS.—Mr. Vanstone tabled specimens of fencing tools made by himself from old scrap iron, &c. Members considered the implements superior to those in general use.

RAINFALL.—Mr. Vanstone tabled year's rainfall to date; 7·70in. have been recorded, of which 0·61in. only has fallen since July 1.

Renmark, August 17.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, Captain Moffatt, F. S. Wyllie, E. Hutton, and E. Taylor (Hon. Sec.).

FRUIT PESTS.—A short discussion on this subject took place, and it was decided to obtain copy of the Vine, Fruit, and Vegetable Protection Act and regulations

ASPARAGUS.—Mr. Harrison gave a short account of his experience in the cultivation of asparagus. He was of opinion that the soil and climatic conditions of Renmark were admirably adapted to the growth of asparagus, for which there should be ready sale.

Boothby, August 22.

Present—Messrs J. T. Whyte (Chairman), A. Robb, R. Carn, J. H. Foulds J. Bell, R. Chaplin, H. G. Evans, G. T. Way, J. R. Way, R. M. B. Whyte (Hon. Sec.), and seven visitors.

STOCK COMPLAINT.—Mr. Carn stated that one of his cows swelled very much after eating, having every appearance of bloat, or hoven. She will not touch green feed. Members recommended burg oil for this trouble.

MANURES.—Mr. Foulds stated that, as far as he knew, no farmers in this district who have obtained commercial fertilisers had received a certificate with them. [Then they have no one but themselves to blame if they are defrauded, as they are entitled to a guaranteed analysis, and it is their duty to demand same from the vendor.—GEN. SEC.] He also read paper by Mr. R. Banyer, from report of Kapunda Branch, page 70, of August issue.

RAINFALL.—Recorded at Clare for six months ending June 30, 4in.; July, 0·74in.; August, to 10th, 1·18.

Appila-Yarrowie, August 18.

Present—Messrs. J. Wilsdon (Chairman), P. Lawson, A. Fox, J. M. Grant N. Hannagan, J. H. Bottrall, W. Stacey, J. O'Connell, J. Daly, W. C. Francis, J. H. Klemm, C. G. F. Bauer (Hon. Sec.), and one visitor.

FALLOWS.—Mr. O'Connell read abstract from Wrightson on "Bare Fallows":—

Fallow, whether cropped or uncropped, occupies the first place in a rotation of crops. After land has been cropped for a series of years it becomes foul with weeds and exhausted of its available plant food, and a period of "rest" becomes necessary.

The art of systematic fallowing was understood by the Romans, and probably before then by the Teutonic races. A three-field system of cropping appears to have been practised even in the first century, "each field lying fallow once in three years"; but it is scarcely likely that one year's rest without cleaning or cultivation would have sufficed to restore fertility. The length of time allowed to elapse between the fallowing varies with the quality of the land.

A period of rest is not indispensable for lands. The continuous growth of wheat may be pursued year after year apparently in endless succession, provided that the fertility of the land is kept up by suitable fertilisers. The exhaustion of land is merely the exhaustion of plant food, and if this is prevented by application of manure growth may be continued for any number of years. It will now be seen that two means are open for restoring the lost balance between the wants of a good crop and the capabilities of a soil for supplying them—"manuring" and "tillage." Manuring is a direct addition of extraneous fertilising matter. Tillage operates by mechanically reducing the soil to a fine condition and exposing new surfaces to the natural forces. Many writers have condemned bare fallow as unnecessary and expensive, and, as a general practice, we should certainly agree with them; but in the case of very heavy clay soils, especially suited for wheat cultivation, there is much to be said in favor of bare fallow.

The objects of bare fallow are the thorough cleaning and conditioning of the land. The *roasting* effect of the sun upon the clods is relied upon for cleaning rather than weeding. It is also clear that a rough condition of soil will be more likely to produce that complete desiccation of the ground which is relied upon for clearing of weeds.

Mr. A. Fox considered it pays every farmer to fallow a portion of his farm, even if he has only a small holding, if he works his fallow well.

Best Wheat for District.—Members consider the best varieties of wheat to grow in this district for grain are Purple Straw, Rattling Jack, and Early Para. For hay, Early Para and Ward's Prolific.

Bowhill, August 26.

Present—Messrs. A. Dohnt, sen. (Chairman), C. Drogemuller, J. Gregory, J. McGlashan, E. P. Weyland, J. Waters, W. G. F. Plummer (Hon. Sec.), and one visitor.

Conference.—It was resolved to hold a conference of River Murray and adjacent Branches at Mannum during February next, and letters respecting this were received from the Branches at Forster, Lyrup, Mannum, Kanmantoo, Renmark, Murray Bridge, and Swan Reach.

Officers.—Chairman, Mr. A. Dohnt, sen.; Vice-chairman, Mr. E. P. Weyland; Hon. Secretary, H. H. Plummer (re-elected).

Annual Report.—Eleven meetings called, with average attendance of seven members. Decided progress has been made despite the bad seasons. Questions arising have received careful attention, knowing, as we do, that all reports are widely circulated through the Press. Each member was urged to bring under notice items of practical interest connected with agronomical pursuits, thus making the whole of the Branches a medium for the exchange of thoughts, experiences, and useful and practical knowledge. It is not now a very difficult matter to find the nature of any disease or ailment affecting live stock or plants, and to learn what remedial or preventive measures ought to be taken in each case, and it will be to the advantage of every member of the Bureau to pursue and acquire knowledge upon all such matters, and to add to the general stock of knowledge; members should be diligent in attending the meetings of the Branch. Experiments with seeds have failed in many cases, owing to drought, but wheats have given the best results. The River Branches have an advantage over many farmers in the dry districts, through being able to irrigate at least a portion of their land. A good many papers have been read, and the discussions on some of them have not been as complete and exhaustive as their merits and importance demanded. Several important questions and subjects have also been considered, some of them having been taken up by most of the other Branches of the Bureau. In combination with the other River Branches a very successful show had been held, certificates given in place of cash prizes. Trees planted on Arbor Day during past two seasons are not thriving, except in a few cases where they have been attended to and protected against rabbits and live stock. Where protected they are doing fairly well. The cemetery ought to be wire-netted to keep out rabbits. Each member should try to bring at least one visitor to each meeting.

Improvement in Ploughs.—Mr. Gregory traced the development of ploughs in this colony, from the single-furrow up to the multi-furrow ploughs of six and upwards, pointing out what he considered to be the defects in the recent forms. In comparison with the increased number of furrows no difference is made in the size and strength of the wheels, &c. A saving of one driver could be made by using a six-furrow plough instead of two three-furrow ploughs. He thought something could be devised to improve the fixing of shares, as there was difficulty in preventing them coming off. Mr. McGlashan thought the six-furrow ploughs, as now generally constructed, would not be strong enough for rough country. Mr. Drogemuller had recently seen shares bolted to the side of the plough, and had seen a six-furrow plough that would stand the test of any kind of land. Mr. Dohnt favored the six-furrow plough, and had noticed that some three-furrow ploughs had been converted into four-furrows, with the result that the frame was not strong enough. Mr. Wayland said some multi-furrow ploughs got greatly out of order at the end of a season's work, going down in the centre and becoming warped through the frame being too light. Messrs. Gregory and Drogemuller said ploughs with wide wheels would not stick in the stumps so frequently as those with narrow wheels; when the share was in the stump the narrow wheels were pulled deeper into the ground, but the wide wheels prevented this.

* * *

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. Cornish, Secretary).

Lobethal Tweed Factory.

By R. Redpath, Manager.

The Lobethal tweed manufactory is situated at the eastern end of the township of Lobethal, in the hundred of Onkaparinga. It is connected with the city of Adelaide by a good road, and can also be reached by train to Balhannah, and thence by road *vià* Woodside.

The buildings and machinery cost over £30,000. The work gives employment to sixty-six hands, composed of sixteen men, thirteen youths and boys, and thirty-seven young-women and girls. Wages are paid according to the nature of the work done and ability of the worker, varying from 7s. to 54s. per week. Eight hours per day are the hours of labor. Most of the public holidays are observed, as well as local holidays. There are two large steam boilers and a thirty-six horsepower engine to supply the motive power. All goods are made of pure wool; not an ounce of cotton, shoddy, or old cloth torn up, is used. The wool is purchased in the Adelaide market. Sufficient is bought for a year's supply during the three months the sales last, at the end of each year.

The mill is composed of five different departments—First, wool department; second, wool scouring and dyeing; third, carding and spinning; fourth, warping and weaving; fifth, finishing.

The Wool Department.—There is a large shed for storing and sorting wool. Both merino and crossbred wool is used in all qualities, and the wool is carefully sorted into the different sorts or qualities, so that it can be spun into the various grists required.

Wool Scouring and Dyeing.—The wool, when it leaves the wool store, is put into a tank of hot water to soak, and it is then put through the scouring machine, and every care is taken so as to get the wool freed from all the natural yolk, sand, and dirt. A plentiful supply of good soft reservoir water is provided, so there is no difficulty in getting it perfectly clean with the aid of one of Petrie's double-bowl scouring machines. The wool is then carried to the dye vats, in about 100lb. lots, and dyed the shades wanted. All the dyewares are imported from England. Nothing is used but the most up-to-date dyes. There is not the slightest fear of the colors not standing, or keeping their color, as well as any imported goods. Having the wool well scoured and plenty of pure water, and an experienced dyer who gained his experience in the West of England, and by using the same dyes that are used in other countries, it cannot be otherwise. After the wool is dyed it is put into the drying machine to dry. A large machine heated with numerous coils of steam pipes effects the drying process.

Carding and Spinning.—The wool in this department is first put through the teazing machine. This machine consists principally of a large iron-spiked cylinder, which goes at a great speed so as to open up the wool which may have got more or less matted in the scouring and drying, and makes it easier for the carding machines. The wool is then put through the burring machine. This machine is constructed so as to take the burrs and grass seeds out of the wool; it consists of a large cylinder, set with steel combs, which catches the wool, and rollers acting as beaters throw the burrs out, and then a large brush takes the wool off the combs. The wool is then put through the teazer again, and oil put on it so as to make it soft for carding and spinning.

Carding Machines.—There are three sets of these very expensive and intricate machines. They are divided into three parts, called the scribbler, intermediate, and condenser. The wool is fed into this machine with a self-acting feeding machine, which can be regulated so as to feed the wool on any thickness required. The wool is taken from the feeding-board and led on to a large swift, or cylinder, by what is called licker-in rollers; the swift goes at something like 80 to 100 revolutions per minute, and this carries the wool forward to the doffer, which is a much smaller cylinder. There are small rollers working on the top of the swift called workers, strippers, and fancys. The workers, which revolve much slower, run in the opposite direction to the swift, receiving the wool from the swift The strippers, which are close to the workers, which run quicker, going the same way as the swift, strip the wool off the workers and give it back to the swift. This process goes on so long as there are any tufts of wool standing out from the swift; but when the last worker is passed the wool is smoothed down, and it then reaches the fancy, which acts as a brush; then it goes on to the doffer and is carried on to another swift, and the same process is carried on until it reaches another doffer, and then it is combed off and led on and wound into a ball in the balling machine. The balls are then put into a bank and fed on to the intermediate, when it goes through the same process of carding again. It is then fed on to the condenser, which is similar to the first and second process, but it is taken off this machine in the shape of soft threads and wound on to what is called condenser bobbins. All the swifts, workers, &c., are covered with fine steel wire, there being as many as 2,000 wires per square inch, according to the fineness or coarseness of the wool.

Spinning Mules.—The factory has five sets of self-acting spinning mules. The condenser bobbins are taken to the mules (or spinning Jennies, as they are sometimes called), and each thread is put through a set of small rollers and led to a spindle, which has a small wooden pirn, and the thread is drawn out and twisted to the thickness wanted, or "grist" as it is termed, which means so many yards or skeins to the dram. From four skeins up to fifty skeins are spun, which means 4yds. up to 50yds. to the dram; hence the necessity of carefully classing our wool. There are over 300 spindles in the width of a mule, and the carriage which the spindles are on runs to and from the rollers (a distance of about 6ft.), which takes the threads from the bobbins. The spindles go slowly at first while the threads are being drawn out, and then change to a great speed to put the twist on to make the thread strong and fit to stand the strain of weaving. When the spindles are full the cops are then taken off the spindles and taken to the weaving department.

Warping and Weaving.—Having got a sufficient variety of yarns in all the shades necessary to make a good range of patterns, the pattern loom is set to work; and this is what is called the designing branch of the business, which is the most important branch of all. The yarns may be worked in the single, or they may be doubled two-ply or more in solid colors or different colors twisted together, according to the effects wanted in the design. All sorts of textures are made from 4oz. per yard up to 20oz. per yard, and then the designer has to consider the styles that are wanted as the fashions change. At one time it may be that weave effects, which can only be got by mixing and crossing the different twills; at other times it may be that bold effects are wanted, which can only be got by fancy yarns; and then it may be faint checks, or stripes, are wanted, and so on. Many books have been written on each branch alone, and many more will be written, so that it is very difficult to even touch on the many points of interest connected with this very important industry in a short article.

There are seventeen looms, 16·4 boxed (platts) and one flannel. All sorts of fancy tweeds are manufactured as well as blankets, flannels, rugs, and fingering yarns. When the yarn leaves the mules it is wound on to warp bobbins, and then a 100 or more of these bobbins are put into a bank, and then wound on to the warp mill the length required, so many ells to make a web, and section after section put on so as to get the number of threads to make the width required. A weaver's ell is 45in. The web is then taken off the mill and put on to a beam or roller. The threads have then to be put through a set of calms, or heddles, which may be two leaves or sixteen leaves, according to the design, each thread having to be put through a separate heddle according to the plan drawn out, and then the threads are put through a reed one, two, or eight threads in the split, according to the setting. The web is then put into the loom and the loom is adjusted and set by the man in charge. The proper cards to make the weave or twill, and then the picking and shuttle-box chains to make the pattern, as many as four to six different colors may be used to make the pattern wanted, and then the loom has to be set to put on the proper number of picks per inch required. After all this, and a number of other things too numerous to mention, the loom is left in charge of the weaver, whose duty it is to keep the shuttles full and tie up any ends which may break, and keep the loom going. The manager says that at a time when there is so much cry of women taking men's places, that it may not be out of place to mention that when the power-loom came into use the old hand-loom weavers would not take to them, and women were put on, and they have remained ever since. They make good wages, and many men with families would be glad of the wages these women earn. The usual length of a web or weaver's cut is 50 ells, which means 100yds. of cloth 28in. wide when it is finished: and this is an average week's work for a loom.

Finishing Department.—When the cloth leaves the loom it is taken to the finishing room, and it is first carefully examined, and all the knots that have been made in the yarn have to be taken out, and all threads that have been broken in the loom and all defects have to be mended by young women, called darners or menders. The piece is then scoured so as to be freed from the oil that was put on the wool for carding and spinning purposes; it is then examined again. Then it is taken to the milling or felting machine, and there the man in charge has to mill the piece into the length and width required. It may have come out of the loom 36in. wide and it has to be milled into 28in., and the same proportion in the length. The cloth is kept soaked with pure hot liquid soap and put through a small set of rollers, and confined into a narrow trough, so as to make the cloth felt. The greatest care has to be taken to protect fancy colors. The cloth is then tentered out to dry, and it is then taken to the giging machine. This machine is a large cylinder covered with iron rods set with teazles. The cylinder revolves, and the teazles strike the cloth and raise the pile or loose fibres on the face of the cloth. The teazle is a vegetable somewhat resembling the Scotch thistle, and is cultivated at the factory, and a crop of some thousands were taken off a small paddock last season, and some thousands of young plants are coming up now in the paddock from seeds which fell out of the ripe teazles last season. The seed is planted in the same way as mangolds, a few seeds being dropped in about 2ft. apart, and then singled out when they come up. Each plant grows very large, in some cases 7ft. or 8ft. high, and yielding from 1 doz. to 6 doz. per plant. Only the small to medium sized ones are utilised. The very large ones were left standing and the seed fell out, hence the present growth. When the cloth leaves the giging machine it is put on the cutting machine, and all the loose pile made on the gig is cut off to show the twill and pattern in the cloth, which was covered up by the milling. This machine is composed of a spiral revolving on a blade or knife, which has to be kept sharp and well adjusted, and is let down close to the cloth as it runs through the machine, and there are several brushes to brush the flock off the cloth. The cloth is again examined, and any defects have to be put right if possible; and, if any damages allowances, have to be made. It is then put into a hydraulic press, after stiff papers have been put between each fold of the cloth, and hot plates are put in between each piece. The pressing is a very important part of the manufacture. It gives solidity to the cloth as well as putting on a certain gloss to give the cloth a fresh appearance.

The goods manufactured are sent each week to Adelaide, by a carrier, to the warehouse in Grenfell Street, from which the trade are supplied. A fair export trade is done with Western Australia and Broken Hill.

The manager does not consider the trade or industry is sufficiently protected, considering the importance of the industry. When it is considered that the colonial articles are only protected to the extent of 15 per cent. on tweeds, and all other industries (many of which should require less) are protected to the extent of 25 per cent. to 100 per cent., it is not surprising that the industry has not made much headway. In Victoria they had as much as 45 per cent., and gradually came down to 25 per cent. No wonder they have got well established. South Australia is the least protected colony in the manufacture of woollen goods. Some hundreds of pounds' worth of soap, soda, and oils are used per annum, all made in the colony, and also a large quantity of belting, string, &c., as well as the many repairs needed, which means work for Adelaide engineers.

From £70 to £80 a week is paid in wages when in full swing. As many as three and four boys and girls of one family are at work, which helps to keep families together: and some hundreds of cords of firewood are used; this is a great help to the small farmers and blockers living in the district. The factory is also connected with the water district, and is rated (only reservoir water is used); from £80 to £100 per annum being paid for water to the waterworks department. The goods are all made out of pure South Australian wool, and the industry is well worthy of the best consideration of the farmers and workers throughout the colony. When federation comes about, no doubt the tariff will be on the Victorian basis.

The difficulty of getting rid of the waste water has been overcome, and arrangements have been completed with the South Australian Company for a block of land at a considerable distance from the township on which to reticulate the waste water; this work will cost a considerable sum of money for digging the trenches, laying the pipes, flumes, &c., and will give employment to a number of local men. Visitors to Lobethal should not fail to pay a visit to the premier Tweed Factory of South Australia.

Legal Cases Affecting Labor.

WORKMEN'S COMPENSATION ACT.

"Arising out of and in the Course of the Employment."—A lad of 13 who had been injured under the following circumstances, claimed compensation from his employer:—The lad was employed doing a variety of odd jobs. Among other things he acted as signal-boy to a crane worked by a certain foreman. By the orders of this foreman he oiled a crusher a fortnight before the accident. On the day of the accident a workman in the same employment, but not under the orders of the foreman above referred to, told the lad that this foreman had given orders for him to oil a machine of which the workman was in charge, and insisted on his doing so, but refused to stop the machine. While oiling the machine the lad was injured. The statement that the foreman had given orders for the lad to oil the machine was not correct. The County Court Judge held that, although oiling the machine was not part of the applicant's regular work, yet, as he did so pursuant to the workman's orders, the accident arose out of and in the course of his employment, and made an award in his favor. On appeal this decision was confirmed, the Court of Appeal holding that the question was, whether there was any evidence on which the County Court Judge could find that this accident arose out of and in the course of the lad's employment, and that it could not be said that there was no evidence to support the finding of the judge, which accordingly ought not to be upset by the Court. —Brown *v.* Scott, Court of Appeal, June 10.

Who are "Dependents"?—The father and mother of a boy who had been killed by an accident while in the employment of a colliery company claimed compensation from his employers as being in part dependent upon his earnings. The family consisted of a father and mother and six children, including the deceased. The father was a collier, earning 25s. a week—the ordinary wages of a collier in the district. The eldest child, a daughter, was earning 12s. a week; the second, also a daughter, was earning 7s. 6d. a week; and the deceased, 16 years of age, was earning 8s. The three youngest children and the mother were not earning anything. The children who were earning wages gave them to their mother to put into a common fund. The County Court Judge held that the parents were in part dependent upon their son's earnings and made an award in their favor. The employers appealed, and it was argued in their behalf that the words "dependent upon his earnings" in the Act meant dependent for some of the ordinary necessaries of life, of which there was in this case no evidence. The Court of Appeal held that, unless there was no evidence on which the County Court Judge could find that the parents were in part dependent upon the earnings of their son, the appeal must be dismissed, and that there was some evidence of this; the appeal was accordingly dismissed.—Davies and wife *v.* the Main Colliery Company, Limited, Court of Appeal, June 5.

Who are "Dependents"?—With respect to the meaning of "dependents" in Scotland, the Act provides that this word shall there mean, "such of the persons entitled, according to the law of Scotland, to sue the employer for damages or solatium in respect of the death of the workman, as were wholly or in part dependent upon the earnings of the workman at the time of his death." A claim for compensation in respect of the death of a workman who met with a fatal accident while in the employment of a firm of builders, was made by the widow of his deceased son and her children, all of whom were dependent upon the earnings of this workman at the time of his death. The Sheriff-substitute dismissed the petition in so far as brought at the instance of the daughter-in-law, but sustained the title to sue of the grandchildren; and upon the question of the title to sue of the grandchildren coming up on a stated case before the Court of Session, that Court upheld the view taken by the Sheriff-substitute on the ground that there existed between the grandfather and his grandchildren a reciprocal obligation of support arising from relationship. —Hanlin *v.* Melrose and Thomson, Court of Session, reported June 28.

Dismissal Without Notice: Refusal to work outside Ordinary Employment.—A stripper and grinder who had been discharged without notice by his employer, a cotton manufacturer, for refusing when ordered by the under-carder to fix a frame strap on a machine other than that upon which he was engaged, brought an action in the county court to recover a fortnight's pay in lieu of notice. The rules of the mill made operatives liable to dismissal without notice for "bad conduct or wilful neglect," and on behalf of the employer it was urged that refusal to obey a reasonable order was "bad conduct." On behalf of the plaintiff it was contended that the fixing of frame straps was no part of the work which he was engaged to perform, and it was argued that if a workman were injured in performing work for which he was not engaged, and which was outside his ordinary employment, he could not recover under the

Workmen's Compensation Act, and it was stated that for this reason the secretary of the Cardroom Association had notified the members that they must not leave their own work and do things that were not their work. The Judge said there was a good deal in the secretary's view of the matter, "because (though doing this work under the direct orders of the under-carder might be held to bring them within the term 'regular employment') the question might arise, where they do it without orders, what would happen in the event of an accident?" He held that the plaintiff's refusal to do work which he believed not to be included in the work which he was engaged to do could not be considered "bad conduct," and did not justify his peremptory dismissal, and he accordingly gave judgment for the plaintiff for the amount claimed, with costs. —Smith *v.* Taylor, Blackburn County Court, June 5.—*Labor Gazette, England, July.*

Government Buildings in course of Construction.

By C. E. Owen Smyth, Superintendent of Public Buildings.

Adelaide Hospital.—The new contagious diseases block, consisting of four large six-bed wards and two observation wards, with necessary offices, baths, nurses' duty rooms, &c., is now being roofed. This building shows up prominently from Frome Road, and when the proposed terraced garden plots are finished, and the unsightly wall of the kitchen compound is covered with brilliant creepers, the block will look very bright and business-like In proximity the bacteriological laboratory building, with living and sleeping rooms for the nurses of the above block combined, is in course of erection, and will face towards North Adelaide and the river. Messrs. King & Son are contractors for the former, and Mr. N. W. Trudgen for the latter building.

The Art Gallery.—This large cut stone building is gradually approaching completion. It will consist of seven galleries; the central three are to form the Elder Gallery, in honor of Sir Thomas Elder, the munificent benefactor of the Art Gallery. The beautiful stamped steel and zinc ceilings are completed and painted, the plasterers will probably finish their work in two months, and it is expected that the building will be out of the hands of the contractor, N. W. Trudgen, by January, 1900.

Parkside Lunatic Asylum.—Messrs. King & Son are finishing the large new block of building, to contain 100 beds, for chronic and excited women. The building is absolutely plain, and looks like what it is meant for. Everything is strong and suitable for the work. Tenders are due this week for another block, to contain 150 beds, which is stated by the Colonial Surgeon to be absolutely necessary, owing to the increase of lunacy.

Gilles Street School.—This building is being rapidly erected, and will be capable of enlargement. The walls will be of brickwork, with dressings, &c., of Murray Bridge stone. Mr. F. Fricker is the contractor.

Large additions are about to be made to the Rose Park school.

The Richmond school has been added to, and the work is nearly out of the hands of the contractor.

Dangerous Machinery: Safeguarding the Circular Saw.

By J. Bannigan, Inspector of Factories.

The circular saw is undoubtedly among the most dangerous of modern wood-working machines, and, as it is widely used both in wood-working factories and for the cutting of firewood in various parts of the colony, the accidents caused by it are numerous. The use of this machine has become so common that workmen too frequently fail to observe reasonable care when attending it, and the loss of a finger or two is, in consequence, not uncommon. Among some of the most useful suggestions for safeguarding the circular saw is the adjustable hood in conjunction with an adjustable or fixed riving-knife. The function of the riving-knife is to prevent the timber from closing behind the saw blade, and so protect the workman from accidents which may occur through any of the following causes:—

1. When the saw-cut closes behind the blade, which takes place chiefly in the case of fibrous green or damp timber, the blade, which is jammed as though it were between the jaws of a vice, carries the timber up with it, and suddenly raises it up in the air, drawing the hands of the workman with it against the teeth, and then throws it backward upon the workman.
2. When the workman does not run the timber parallel with the saw-blade, or when the timber slips in consequence of knots or cracks.
3. When the teeth are badly sharpened or badly set.
4. When the blade is warped or badly attached to the shaft.

In the three latter cases the timber is seized and thrown forward as in the first case.

The projection of teeth or part of the blade arises from causes 3 and 4, from the heating of the blade in a narrow saw-cut, or, when the wood is dry, from knots which revolve loosely.

The riving-knife should be made of steel, and should have a thickness equal to the breadth of the narrowest cut of the various saws that may be used, and should be attached behind the blade in exactly the same plane, so as to keep the saw-cut continually open. The length of the knife at the surface of the bench should be about 8in., and rising to the height of two-thirds of the saw-blade above the bench, and fashioned so as to follow the curve of the saw teeth. The knife is sharpened like the blade of a knife at the edge next the saw, so as to facilitate the passage of the timber.

If, as is usually the case, the diameter of the saw discs vary to any great extent, the knife must be movable, so as to be brought as near the teeth as possible. To this end one or more slots are cut in the knife-holder or in the heel of the knife itself. The knife can be fixed to an angle of wrought or cast iron, or to a cast-iron plate in which the slots are cut to allow of the knife being arranged to suit the diameter of the saw; or it may be bolted to the under part of the frame and allowed to project through behind the saw-blade, slots being made to admit of the necessary adjustment. To ensure absolute safety a bolt is screwed to the upper end of the knife, to prevent the timber from being lifted up even if the knife used be narrower than the saw-cut. When the saw has to work in very thick timber this bolt can be very easily removed.

One of the great advantages of the fixed riving-knife is that the back of the saw is prevented from touching the side of the saw-cut in the timber and detaching splinters which may be hurled in the face of the workman. It also prevents loose pieces of timber from accidentally coming into contact with the back of the saw and being picked up by it, as well as being a protection to those engaged in handling the timber. The hood may be affixed to the upper part of the riving-knife by means of a thumb-screw, and may be adjusted to any height. It is composed of sheet-iron partly open to enable the workman to see the cutting part of the saw blade, and during the intervals when the saw is not being used, but still running, the hood is allowed to drop down to the bench, rendering the saw perfectly safe. The hood is particularly applicable to saws used in cutting small timber or firewood, as it prevents the saw from catching up splinters of wood and throwing them, to the great danger of those in the vicinity.

In affixing the adjustable hood and riving-knife, the following conditions must be observed;—The workman must not be prevented from seeing the working point of the teeth or from following the course of the saw-cut. The guard should be attached in such a way that the bench remains free for as great a distance as possible, so that work may not be interfered with. It should satisfactorily resist any longitudinal or transverse thrust or pressure. It should permit the workman to keep almost continually at work without having to be lifted up or to be taken completely away.

The Labor Bureau.

BY SUPERINTENDENT OF LABOR BUREAU.

Number of persons for whom employment has been found by Government Departments and private employers through the bureau since January 1st, 1899.

Assistants to Colonial Surgeon	2
Bakers	9
Boilermakers, Assistants, Rivetters, Blacksmiths, and Strikers	81
Brassfinishers and Coppersmiths	6
Carpenters and Cabinetmakers	41
Compositors	13
Divers and Assistants	4
Gangers and Caretakers	3
Laborers	2,468
Masons and Bricklayers	40
Moulders and Plumbers	7
Painters	47
Patternmaker and Meter Fixer	4
Porters and Youth Porters	52
Sailors—Crew	7
Scullerymen	11
Shipwrights and Fencers	18
Stonebreakers	209
Stone and Granite Dressers	20
Survey hands	12
Tinsmiths and Drillers	3
Turners and Fitters	19
Wellsinkers and Borers	16
Youths and Nippers	89
	3,188

The Broken Hill Mining Industry.

The Mines Pay-sheet—Number of Mine Employés—The Latest Figures.

The following figures, showing the number of men employed on each mine along the line of lode, are speaking evidence of the immensity of the interests worked. They are substantially correct, having been supplied by the mines officials:—

	Surface.	Underground.	Total.
Broken Hill Proprietary	1,000	616	1,616
Block 10	275	360	635
Central	291	492	783
South	157	307	464
Block 14	196	436	632
British	160	340	500
Junction	127	317	444
Junction North	106	150	256
North	86	96	182
Total	2 398	3,114	5,512

The mines off the main lode, including the A. B. H. Consols, Pinnacles, and Little Broken Hill, and those at Thackaringa and elsewhere, employ about 150. Besides the above, the B. H. Proprietary employs something like 1,300 men at the works at Port Pirie, and Block 14 probably about 450 hands at Port Adelaide. The Magnetic Zinc Separation Works at West Broken Hill employ about 60 men, which number will be materially increased shortly. Of the B. H. Proprietary's 1,000 surface hands, 363 are employed continuously in the open cuts. Including the men employed in the outside mines and in transhipping ore, &c., the mines give local employment to 5,860 men; including the men at the Port Pirie, Port Adelaide, and Cockle Creek smelting works, the total is about 7,890.—*Barrier Miner.*

A Week's Work—Broken Hill's Seven-day Output—A Million and a Quarter Tons a Year.

The weekly output of the Broken Hill mines at the present time is as under:—Broken Hill Proprietary, 8,300 tons; Central, 4,200 tons; Block 10, 3,200 tons; Block 14, 2,200 tons; British, 2,150 tons; South, 2,000 tons; Junction, 2,000 tons; North, 950 tons; Junction North, 900 tons. Total—25,900 tons. This in just in excess of a million and a quarter tons a year; and the quantity is steadily increasing.—*Barrier Miner.*

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NOTES AND COMMENTS.

The past month has been the most favorable September for several years. The dry spell during July and August left both crops and feed in a very precarious position over the greater part of the Northern Areas, but fortunately splendid rains fell during the first week of September. The highest fall was recorded at Cradock, 2¼in., and the whole of the dry districts received good soaking rains, nearly every station north of Adelaide recording over 1in., and very many over 1½in. Since then the weather has been very favorable, nice showery weather and warm days alternating. The crops and feed have revived and made splendid progress, and there is no doubt that with favorable weather during the next few weeks the average returns will be higher than for several years, though the hay crop generally may be rather light. The rain during the month has generally been of a steady soaking nature, and in some districts little water has been caught, and water-carting has only ceased temporarily.

The much-vexed question of the standard bushel was well discussed at Congress, and the Hon. Mr. Addison's remarks on the necessity for fixing the standard each year are commended to the notice of those who advocate a fixed standard. There is much misapprehension about this matter, but there is not the slightest doubt that under the present system there is no encouragement for a grower to clean his wheat well; in fact, just the reverse. The man with wheat weighing 63lbs. per bushel receives just as much per 60lbs. as the man who has cleaned his wheat up to 65lbs. or more; the consequence is that the wheat is not cleaned as it should be, and our average samples, as sent out by the Chamber of Commerce, are certainly not creditable to the colony, nor calculated to enhance the reputation of South Australian wheat. If the general wheat merchants cannot offer any inducement to produce higher quality grain by paying a little more for it, it rests with the farmers to so support the South Australian Farmers' Union as to enable them to make whole shipments of wheat above the standard adopted by the Chamber of Commerce, and so prove whether it will pay or not to give more for the better samples.

Considerable complaints have been made that the prevalence of bunt in wheat crops where the seed has been pickled was due to the use of adulterated bluestone rather than to faulty methods of pickling. Similar complaints were made in Victoria; consequently the Department of Agriculture had samples sent in from various parts for analysis. Mr. A. N. Pearson, the Government Agricultural Chemist, now reports that in the majority of cases the percentage of sulphate of iron in the samples did not exceed 1 per cent., and in only one instance was it any way near 2 per cent. This is considered to be satisfactory evidence that the non-success of pickling cannot be attributed to inferior bluestone, and there is little doubt the same applies to South Australia.

Reference is often made by farmers to the low price of wheat, and suggestions made for combining to obtain higher prices. Various schemes have been mooted with this object in view, in apparent forgetfulness that in nineteen years out of twenty the price we get must be regulated by London prices, which vary according to market prospects in the principal producing countries It is only in seasons when our production is not in excess of local demands that the price is not so regulated, and even in such cases a heavy Californian crop would prevent local prices rising higher than the expense of freight, commission, duty, &c., plus prices in California When it is remembered that the United States exported in 1898 as wheat and flour over 217,000,000bush. of wheat, that Argentina last year exported 55,000,000bush., while India, Russia, and other European countries are also very large exporters of grain, it will be seen how ridiculous it is to talk of regulating the price of wheat by any action we may take with our total production of less than 9,000,000bush. The farmer must sell his wheat, and the wheatbuyer can only give a price equivalent for what he can secure in the London market.

In California, where the 2bush. wheat bag is always used, the grain is handled very much more expeditiously than in the Australian colonies. It is estimated that over 27,000,000 of bags are used for an everage crop. The same arguments used here against the smaller bags, *i.e.*, extra cost of bags and handling, bags more easily damaged, &c , were also used in California, but have proved to be absolutely of no account. Mr. Sinclair, the Victorian Travelling Expert, states that the wagons used in the transport of the wheat to the mills and railways are without sides and open floored. One man can comfortably place the bags on any part of the wagon from the ground, and when required to be raised 5ft. or 6ft. they are easily tossed up by two men. With the small bags the wagons are also loaded and unloaded much quicker than with our cumbersome bags holding up to 280lbs. When will Australian farmers become sufficiently united to demand the adoption of the 2bush. bag ?

The *Australasian* says:—"The present daily consumption of frozen mutton and lamb in Great Britain is 18,000 carcasses, and it is expected that before the century ends it will have risen to 20,000 carcasses daily, as cool stores are being erected in different parts of the United Kingdom for the purpose of receiving the frozen products of this and other countries. In the export of lambs New Zealand is developing a profitable trade; and, though Victoria and Riverina have made a fairly good start, we are a long way behind when the possibilities are considered. Right through the whole of last year a healthy demand for lambs existed at home, and at no time did stocks accumulate. The export of lambs from New Zealand during 1898 aggregated 1,136,696 carcasses, as compared with 1,021,722 carcasses in 1897, 786,828 in 1896, and 236,042 in 1895."

The General Secretary of the Agricultural Bureau desires to rectify an erroneous statement made by himself at the eleventh Congress held last month with respect to duty on milk separators. This duty was remitted some time ago with a view to promoting the export of butter to Great Britain. Whilst it remained in force it was a great drawback to the dairy industry, and made the use of the separators almost prohibitive to owners of small dairy herds.

The Camperdown Butter Factory, Victoria, purchased during the year ending May 31, 1899, 2,750,236galls. of milk, for which £45,030 17s. 1d. was paid, the average price 3·93d. per gallon. From this 1,262,245lbs. of butter was made, it taking 21·71lbs. of milk to each pound of butter. The total receipts amounted to £56,463 19s. 4d., the actual profit to £2,916 16s. 7d. The shareholders received a dividend of 7 per cent., and the milk suppliers a bonus of ⅜d. The butter cost for manufacture 0·69d. per pound selling charges 0·94d., profit 0·55d. Price averaged 10·74d. per pound. How many of our factories keep their books in such a manner that similar particulars could be given?

It is reported that the Central Rabbit Board, Queensland, has decided to discontinue the experiments with chicken cholera for the destruction of rabbits, as the results have not borne out the expectations based on the first series of experiments. The general opinion appears to be that both in respect to cheapness and effectiveness poisoning with phosphorus is best.

The N.Y. State fertiliser law has been amended, and several radical changes have been made. Formerly fertilisers which sold at less than £2 2s. a ton were exempt from the operations of the law. As a result some frauds were put on the market at 37s. 6d. a ton. The limit of selling price is now 21s. a ton, and this will keep out several mixtures that had no merit except a low price. Every brand bearing a distinctive name must be licensed by the payment of a fee of £5. The object of this is to decrease the number of brands offered for sale. Manufacturers have been in the habit of putting up dozens of different brands of fertilisers, practically taking them out of the same bin, but giving different names to please local agents. This has proved confusing to farmers and expensive to the State. The £5 fee will soon cut down the number of brands, and put the business on a more sensible basis.

The red field poppy continues to spread in the wheat fields, and in many parts seriously affects the returns. This is especially the case where sufficient care is not taken to clear the land. All weeds must have a beginning on the farm, and if the farmers generally would adopt the measures taken by some of our farmers, *i.e.*, to carefully pull up and destroy any weeds like poppy, charlock, &c., that may be seen, these plants would not become so troublesome. Although it may seem unpractical to suggest going through the crop and pulling up the weeds before they seed, still it is done by a number of our best farmers, and they are quite satisfied that the trouble involved is more than repaid by the gain to the crops. Thorough cleaning of the seed is also necessary if the land is to be kept clean.

Complaints are being made of the damage being done in various parts of the North by myriads of young locusts. It is a great pity that none of the sufferers can be induced to make a reasonable effort to destroy them before they develop wings and reach the flying stage, when nothing practicable can be done. On several occasions reference has been made to the splendid results obtained in South Africa from the use of poisoned baits for the locusts. One or other form of arsenical poison with sugar or treacle is used on green stuff and placed near the swarms. The young locusts are very fond of the sweetened baits and are killed by millions. Where the swarms are on clear land, rolling or driving a flock of sheep back and forwards will destroy the greater portion. Something should certainly be tried, as the remedies are not expensive. If the owners of affected land would make a reasonable effort to destroy the locusts instead of contenting themselves with complaints about the damage done they would certainly be the gainers.

ANGORA GOATS.

Quite recently a resolution was adopted in the Cape Colony Parliament affirming the desirableness of prohibiting the exportation of Angora goats. A year or two previously the same Government was induced to prohibit the exportation of ostriches. It is less than five years since the Cape Colony was much concerned because the Turkish Government prohibited the exportation of Angora goats, lest other countries should attempt competition in the markets of the world in the matter of Angora "wool" and skins. Since then, not only the Cape farmers, but also the American people have culled and selected their herds of Angoras until they are so improved that it is doubtful whether the Turks can find anything to excel—or, perhaps equal—them in quality and character.

Notwithstanding the prohibition, it is an easy matter to procure ostriches from South Africa, and if the latest resolution should be adopted by the Government, there would be no need to purchase pedigree Angora bucks and does from the Cape Boers whilst America possesses thousands equally pure and good, and would be willing to sell any number at a fair price. In these days of keen competition it is worse than useless to create a monopoly in such things as goats and ostriches, whilst they can be purchased elsewhere equally good in quality, and possibly at lower prices. The chief reason why Angora hair (or "wool") has not commanded a large and highly profitable market has been the fact that the supply has been altogether too limited to justify extensive works for manufacturing the material, but latterly the Cape colonists have devoted a lot of attention to this industry, and mohair has been placed on the European markets in increasing quantities, so that manufacturers feel justified in extending their operations, and the demand increases as the supply extends. In years gone by Turkey supplied pretty nearly all the mohair in the market, but now we have Cape Colony raising immense numbers of high-class goats; Natal, Rhodesia, Damaraland, the Portuguese territories, and last, but not least, America, have all entered with spirit into the industry, so that supplies are not at all likely to fall off, and mohair will become as much a staple article of commerce as wool is. The greater the amount produced the more stable will be the demand; and, although the high price of 2s. 6d. per pound may not be maintained, it would still pay exceedingly well to grow at a much lower rate. A farmer who owns some large flocks of Angoras in Arizona and Ohio recently wrote to the *Rural North-West*: "I have two fifth-cross goats which have 15in. hair, and shear from 9lb. to 10lb. fleeces." In this connection it is worthy of note that the state of Oregon alone last year produced 220,000lbs. of mohair. The American Government imposes a duty of 6d. per pound on all imported mohair.

It is only a very short time since a splendid flock of pure Angoras was broken up in this colony after a lengthy and courageous struggle on the part of the owner to make them popular with our colonists. They were sold "for a song," as it were, and a few of the best bucks were sent to Africa, where they were greatly appreciated, and brought very high prices. The portion of the colony where they were bred was probably not altogether well suited to their habits and requirements, and not many colonists who might have taken up the industry had an opportunity of seeing the herds or of learning the "possibilities" (which now appear to be "certainties") attaching to the scientific breeding of pure Angora goats. The profit does not attach only to the mohair, but also to the skins, which have a much higher value than those of the sheep; and it is a fact that the goats are more hardy and more prolific than sheep. They thrive on rocky lands, and live upon shrubs and herbs which would not be touched by sheep, as well as upon the natural grasses of the fields. In regard to goat skins, there is an enormous demand in America and some parts of Europe for goat skins. Angoras are mostly in favor. For certain kinds of leather the young goats are killed and skinned directly they are born. A goat farm has just been started in New Mexico by Robt. Foerderer, of Philadelphia, in connection with L. Beebe, a leather dealer of Boston, and other capitalists, who have stocked it with 45,000 to 50,000 breeding goats. In Mr. Foerderer's tannery it is said there are 40,000 goat skins used per day, mostly from Central and South America. The best skins are said to come from the warm, dry regions of Northern Africa. A short time ago a London speculator secured 340 square miles in Northern Australia upon which to raise goats for their skins.

Probably the rough country of Kangaroo Island would suit Angora goats. They browse in preference to grazing, and they would find plenty to browse upon there.

The following item is extracted from the Capetown letter, dated August 17, 1899, to the *Australasian Pastoralists' Review*:—

> A Bill to impose a duty on the export of Angora goats has been gazetted, and comes on for second reading to-morrow. It provides that a duty of £100 is to be imposed on every Angora goat leaving the colony; but it also provides that no such duty shall be payable on export to any neighboring state or colony which shall, by its own legislation, have imposed a duty on the export of Angora rams and ewes not less than the amount imposed by this Act. The penalty for exporting Angora goats without payment of duty is a fine of not less than £25 and not more than £100 for each goat exported, with a corresponding term of imprisonment in default of payment. The following figures in connection with the mohair industry may be of interest to your readers. Comparing the colony with the most important province of Asia Minor—Angora—the area of Angora is 29,000 square miles, and area of Cape Colony 221,841 square miles. It must be borne in mind, however, that only a very small portion of the colony pays attention to Angora goat breeding at present. The five leading districts, viz., Somerset East, Aberdeen, Cradock, Jansenville, and Willowmore produced 100,000 Angoras more than Angora. For the years 1891 to 1894, inclusive, Angora produced 1,230,000 Angora goats, and the Cape Colony produced 2,891,223. During the same period the production of mohair in Angora was 3,360,000lbs., and in Cape Colony 9,982,000lbs. The average yield of mohair per goat was, in Angora, 2¾lbs., and in Cape Colony 2½lbs. The value of the production was, in Angora, £200,000, and in Cape Colony £419,500. The average value per pound was 1s. 2½d. in Angora, and in Cape Colony 10½d., and the money realised on the average goat was 3s. 3½d. in Angora, and 2s. 11½d. in Cape Colony.

Warts on Teats.—It is stated that an effective and painless cure for warts on the cow's teats is the application of castor oil. The fingers should be smeared with oil and the affected teats rubbed gently every day for a few weeks. Then rub the udder with oil so that it runs down along the teats.

AGRICULTURAL BUREAU CONGRESS.

The Eleventh Annual Congress of the Agricultural Bureau was held on Wednesday, Thursday, and Friday, September 13, 14, and 15 respectively. Mr. F. E. H. W. Krichauff, Chairman of the Central Agricultural Bureau, presided over the meetings.

The following members of the Bureau attended one or more sessions:—Central Bureau: Messrs. F. E. H. W. Krichauff (chairman), W. C. Grasby, Thomas Hardy, M. Holtze, W. Lowrie, T. Price, A. J. Perkins, T. B. Robson, Hon. A. W. Sandford, M.L.C., C. J. Valentine, and A. Molineux (secretary). Amyton: Messrs. S. Thomas and J. Gum. Angaston: Messrs. A B. Robin and F. Salter. Appila-Yarrowie: Messrs. C. G. F. Bauer, J. H. Bottrall, E. Catford, J. M. Grant, W. Stacey, and J. Wilsdon. Arden Vale: Messrs. A. Hannemann and M. Eckert. Arthurton: Messrs. W. H. Hawke and J. B. Rowe. Balaklava: Messrs. P. Anderson and J. Vivian. Baroota Whim: Messrs. F. H. Flugge and C. W. Hoskin. Belair: Mr. O. Nootnagel. Bowhill: Messrs. W. Gregory and W. G. F. Plummer. Brinkworth: Messrs. S. Aunger and J. Stott. Burra: Messrs. J. Flower and F. A. S. Field. Bute: Mr. E. Ebsary. Caltowie: Messrs. J. A. Leahy and P. O'Loughlin. Carrieton: Messrs. J. B. Harrington and M. Manning. Cherry Gardens: Messrs. T. Jacobs and C. Ricks. Clare: Messrs. W. Kelly and W. Kimber. Clarendon: Messrs. A. L Morphett, J. Spencer, and W. Spencer. Colton: Mr. E. Whitehead. Crystal Brook: Mr. W. J. Venning. Davenport: Messrs. W. J. Trembath and F. B. Rathbone. Dawson: Messrs. F. Schebilla and O. Muller. Dowlingville: Mr. T. Illman. Elbow Hill: Messrs. W. C. Ward and E. Wake. Eudunda: Mr. J. von Bertouch. Finniss: Mr. A. E. Henley. Forest Range: Mr. J. Sharpe. Forster: Messrs. J. D. Prosser and A. Towill. Gawler River: Messrs. J. S. McLean, H. Roediger, and F. Roediger. Gladstone: Messrs. E. Coe and C. Gallasch. Golden Grove: Messrs. A. Harper and T. G. McPharlin. Gumeracha: Messrs. W. P. Bond and W. Cornish. Hahndorf: Mr. F. Sonnemann. Hartley: Mr. J. B. Sanders. Hawker: Messrs. J. Hill and J. Smith. Holder: Mr. J. M. Grant. Inkerman: Messrs. D. Fraser and W. Hewett. Johnsburg: Messrs. G. H. Dunn and T. A. Thomas. Kadina: Mr. T. M. Rendell. Kanmantoo: Mr. Thos. Hair. Kapunda: Messrs. W. Flavel, H. T. Morris, W. M. Shannon, and G. Teagle. Koolunga: Messrs. T. B. Butcher and J. Button. Mallala: Messrs. G. Marshman, H. B. Moody, and A. W. Moody. Maitland: Messrs. A Jarrett and J. Smith. Mannum: Messrs. Hy. Brown, J. G. Preiss, and F. E. Schuetze. Meningie: Messrs. H. B. Hacket and W. Tiller. Millicent: Messrs. E. J. Harris, A. McRostie, and H. Oberlander. Minlaton: Messrs. H. Boundy, Jos. Correll, W. Correll, J. Martin, J. McKenzie. Mount Bryan East: Messrs. E. T. Prior, J. Prior, W. Dare, H. W. Collins, and T. Best. Mount Gambier: Messrs. W. Barrow, E. Lewis, W. Mitchell, J. C. Ruwoldt, J. Umpherston, and J. Watson. Mount Remarkable: Messrs. T. H. Casley and C. E. Jorgensen. Morgan: Mr. J. Wishart. Mundoora: Messrs. R. Harris and J. J. Vanstone. Murray Bridge: Messrs. B. T. E. Jaensch and W. F. Wundersitz. Mylor: Mr. W. G. Clough. Morphett Vale: Mr. A. C. Pocock. Nantawarra: Mr. J. W. Dall. Naracoorte: Messrs. O. Hunt and J. Wynes. Narridy: Messrs. A. McDonald and W. J. Martin. Norton's Summit: Mr J. Jennings. Onetree Hill: Messrs. J. Clucas, J. Flower, and J. Hogarth. Orroroo: Messrs. J. Moody and T. H. P. Tapscott. Paskeville: Messrs. W. S. O'Grady and H. Palm. Penola: Mr. H. Ricketts. Petersburg: Messrs. W. Miller and T. Selby. Pine Forest · Mr. R. Barr, jun. Port Broughton: Messrs. R. W. Bawden, E. Dennis, and H. H. Whittle. Port Elliot: Messrs. J. Brown, E. Hill, P. O.

Hutchison. Port Germein: Messrs. G. Stone, A. H. Thomas, and H. H. Glasson. Port Lincoln: Mr. E. Chapman. Port Pirie: Messrs. E. J. Hector, W. Humphris, and P. J. Spain. Pyap: Mr. H. J. Brocklehurst. Quorn: Messrs. A. Hall and J. B. Rowe. Redhill: Messrs. G. Wheaton and F. C. Wake. Renmark: Mr. H. Showell. Richman's Creek: Messrs. J. M. Kelly, J. McColl, and P. J. O'Donohue. Riverton: Messrs. M. Badman, W. Hannaford, T. Gravestocks, and D. Kirk. Robertston: Messrs J. Armstrong, A. Day, T. Hagley, and N. Westphalen. Stansbury: Mr. G. Sheriff. Strathalbyn: Messrs. J. Cheriton, M. Rankine, R. Watt. Stockport: Messrs. J. Murray, J. F. Godfree, and D. G. Stribling. Swan Reach: Messrs. P. A. Hasse and J. O. J. Kohnke. Tanunda: Mr. J. H. Walden. Tatiara: Messrs. W. E. Fisher, H. Killmier, T. Stanton, C. H. Wiese, E. Prescott, W. Montague, D. Makin. Wandearah: Mr. E. Joyce. Watervale: Messrs. C C. Castine and E. Treloar. Willunga: Messrs. W. J. Blacker and T. Pengilly. Woodside: Messrs. R. P. Keddie and A. Hughes. Woolundunga: Messrs. H. Aldenhoven, J. Grunike, T. H. Prosser, and J. H. Michael. Yankalilla: Mr. T. Stacey. Yorketown: Messrs. J. Davey and J. Koth.

The Opening Ceremony.

The CHAIRMAN OF THE CENTRAL BUREAU (Mr. F. E. H. W. Krichauff) said: Gentlemen—You will, I am sure, have much pleasure in hearing the address by the Minister of Agriculture. I am sure you will all be exceedingly pleased to welcome him, especially under the peculiar circumstances—after we have had such nice rains. (Cheers.) You are all, of course, now looking forward to a good harvest, and I trust you will get it. (Cheers.)

THE MINISTER OF EDUCATION AND AGRICULTURE (Hon. Richard Butler, M.P.), in delivering his opening address, said: Mr. Chairman and gentlemen—I must confess that, if this meeting had been held on this day last week, I do not think many of you would have had so happy an expression on your faces as you have to-day. It affords me much gratification to be in the position I am in to-day and to accept the overtures which were made by the Central Bureau to say a few words to my fellow-farmers who are assembled here. On this same occasion last year I expressed the wish that I might be honored by being able to address you as Minister of Agriculture this year. I said, however, that we had a general election to face, and that I had to appeal to the electors of Yatala for a renewal of the confidence they placed in me by making me their representative. So that, while not looking for a perpetual term of office, I hoped to retain the goodwill of Yatala and the House of Assembly so as to have the opportunity of saying a few words to you to-day. (Hear, hear.) The pleasure I feel in being here is intensified by the fact that I can appreciate just as much as you can the difficulties and disadvantages under which a farmer labors in South Australia, and so can my colleague the Commissioner of Crown Lands, the Hon. L. O'Loughlin. (Hear, hear.) We have ourselves been producers all our lives, and our sympathies must therefore naturally be strongly with those who are working on the land. (Hear, hear.) I have a litte quotation here which, I think, fairly describes the farmer's position—

> The farmer's trade is one of worth—
> He's partner with the sky and earth,
> He's partner with the sun and rain—
> And no man loses from his gain.
> And men may rise and men may fall,
> The farmer, he must feed them all.

(Cheers.) You all realise that we are partners with the rain, and we are all very glad to be partners with it on the present occasion, because if the timely showers had not come we should have had very little this season with which to feed the people of South Australia. I hardly know what we should have done if the dry weather of the past weeks had continued for another month. (Cheers.) Twelve months ago I told you that I thought the prospects of a good harvest were never better than then, and I think I am justified in saying that you all agreed with me. (Cheers.) It only shows how precarious are our seasons when we remember that we had no later rains to revive our crops, and it shows also how difficult it is for a farmer in South Australia to lay down hard and fast rules for carrying on his avocation. In many districts I saw early wheat in ear in October last year, and at the same time it seemed impossible for the late wheat to come into ear. When I saw this I did not think I should ever sow any late wheat again. But you know well how the early wheat was cut up by the frosts in one fortnight, and the late wheat in many parts was the best after all. So that I now sow both late and early wheat, just as I did previously. (Hear, hear.) The Government believe—I do not know whether you agree with us there—that we are a producers' Ministry, but for all that we do not think the producers want us to give them too much coddling. (Hear, hear.) While they do not want too much, we recognise that State assistance is a very good thing in certain directions, and that instead of checking private enterprise, as some would have us believe, it rather stimulates it. (Hear, hear.) The Government, however, do not think it is necessary at the present time to go to the expense of £20,000 or £30,000 to establish dairy farms in various parts of the country as Mr. Rounsevell would have us do. We think that the expense would not be justified by the results; and we think also that the work that our Dairy Instructor, Mr. G. S. Thomson, is doing in travelling through the country, lecturing in various centres, and giving instruction to anyone who requires it, is as valuable in the way of dairy education as if we started three dairy farms, which I do not believe we should get many students to attend. (Hear, hear.) The Government, however, are quite alive to the fact that more can be done to help along this great industry. The Government for some time now have been purchasing pure-bred bulls of good milk-producing families for distribution through the country, so that the farmers can get the benefit of having an improved strain. We have already seventeen of them established in different centres, and I believe their progeny number now at least 500. That has been done in the course of two or three years, and already there is a great improvement going on in the dairy cattle of South Australia in consequence of this. Mr. Alick Murray, who has been acting for the Government in this matter, and on whose judgment I believe every producer in South Australia relies (cheers), has just chosen six more bulls in addition to his previous purchases, so that in the course of a week or two I shall have the pleasure of distributing them amongst you. That will make twenty-three first-class bulls now obtained for this purpose by the Government. (Cheers.) The question now is whether we have not gone far enough in this direction, and whether it would not be advisable to get a few good cows of the best milk-producing qualities and establish them at the Agricultural College, at Roseworthy. There we shall shortly be able to get the Barossa water, and be able to show farmers what can be done with a little irrigation in the shape of dairy farming. I think it will be better to do this than to go in for expensive dairy farms, because we shall have abundance of water and it will be a splendid object lesson as to the value of irrigation in places where water can be got. I think it will pay us farmers to have it even at 2d. or 3d. a thousand gallons. We can have an orchard and keep a dairy and in many ways improve our homesteads. (Hear, hear.) Although I have a river running through my property it would have paid me handsomely last year if I could have got the Barossa water, because in our district, although the rivers do not go dry, they get salt in the summer, and it is impossible to properly keep sheep or dairy cattle unless you have a good permanent supply of fresh water. (Hear, hear.) In the future I do not think we shall go in for putting in such large areas of wheat as in the past. We are beginning to realise that more thorough cultivation and the use of artificial manures will give us better results on a small area than we can get now by planting perhaps half our land each year for only a small return. The object of the Government in passing the Fertilisers Act was to assist in these improved methods of farming, and I think it has worked fairly well. We have as Chief Inspector under it Mr. W. L. Summers, who is an exceedingly able and zealous inspector, and we hope to be able to arrange to get samples of manures earlier in the season than last year, so that we can get them tested and advertise the results in the papers as a guide to farmers where to go for manures. (Hear, hear.) I ask the farmers to work with the inspector, and to be careful to get guarantees with all the manures they buy. If two or three of them club together where they live in the same district and buy from the same firms they can send down a combined sample for analysis, and thus save a considerable amount of expense. It is possible, Mr. Summers tells me, that the Bill will want amending in some directions, and the Government will gladly do it if necessary. They want, however, to give it another season's trial. This year the farmers of South Australia have purchased something like 20,000 tons of fertilisers, costing them about £100,000, and I believe scientific manuring is going to take on still more in the future. (Cheers.) The Government have also during the past two or three years been getting reports, from the Government Geologist and other experts, as to the possibility of finding valuable deposits of phosphates in South Australia. If we can only discover such deposits as have been found in Florida and other places it cannot fail to be a good thing for the colony. (Cheers.) In addition to the reports from the experts we intend to offer a bonus to anyone who discovers a payable deposit. (Cheers.) Of course we recognise that anyone who did so would reap a great reward out of the discovery itself, beside which the bonus would be small, but it may have the effect of stimulating the search for these deposits. Now I want to say a word or two about a department which has been very roundly abused in some quarters and warmly praised in others—the Produce Export Department. And I want to ask you if it is any the worse for being a "State" Department. I know there are men who are very glad to realise 4s. or 5s. extra for their lambs through the department, and yet would repudiate with scorn the idea the Government was doing anything for them. I think this is rather a narrow-minded view to take. (Hear, hear.) I have watched and directed this department very carefully during the time I have been in office, and there is no public institution which has been established in South Australia which is going to do more for the producer than this. It has always been my policy to give the producers the fullest knowledge of the working of that department and the prices we are making in London for the produce entrusted to us. I was called over the coals in an article in the *Register* newspaper some time ago complaining that I was not treating the middlemen properly. I may say that this institution was not established for the middlemen —it is meant to benefit the producers of the colony. (Hear, hear.) I have here a circular, issued by Messrs. Willcox & Co., in which that firm says, in speaking of the Produce Export Department:—"It will certainly be admitted by anyone who has followed the daily literature on the subject that a great deal has been made of sales of *small* lots of lambs, which have happened to prove highly remunerative, while significant—and shall we say misleading?—silence has been preserved concerning those much more numerous and larger lots which have realised sometimes a loss and sometimes only a bare margin of profit." That was a deliberate attempt to prove that my statements have been misleading, and really means that I have been encouraging the producers of South Australia to ship their own produce by quoting the prices of two or three lots which made exceptional value, knowing that the general average was much lower. I felt that pretty keenly, and I at once replied to it. The department has not been run with a view of doing an injury to the middlemen, and the best proof of that is that last year they nearly monopolised it, and we actually had to refuse various small lots sent by farmers. Through the courtesy of Messrs. Elder, Smith, & Co. I was able to get the value of all lambs shipped to London last year by that firm, and I have of course the figures relating to the Export Department. I published them in the papers, and showed that the average net price realised for 6,000 lambs was just about 10s. each—that is 10s. in South Australia. When we remember what a little while it is since we started this industry, and how we are only beginning to improve our various breeds of sheep so as to cultivate it as far as possible, I am sure you will agree with me that we have done well, especially as there were some lots which were not up to the average, and which only brought about 7s. (Cheers.) I wrote to the *Register* and said that if those who had shipped and made losses would publish particulars of them I was quite prepared to publish the whole results of the transactions through the department. They were not prepared to accept the challenge, and very wisely too. If I were a buyer of lambs I should get them as cheaply as possible and I should not go about telling the men who sold them to me that I had made 3s. or 4s. each out of their lambs. (Laughter.) The department was established in order to dispose of our by-products and that our producers might test the London market with their produce. I ask you to agree with me that it is very much better not to sell the whole of your lambs, or anything else you have to dispose of, in South Australia, but to take the risk of sending some to the London market, because it is only by testing that market that you know what to ask for your goods here. As the result I know of cases where lambs have been sold here lately at considerably over the price paid for them last year. I know of one case where 2,000 were bought by a buyer at a considerably higher price than he paid for similar lambs to the same seller last year. (Hear, hear.) That does not look as if that buyer made a loss last year. The result will be that instead of only growing enough lambs to supply ourselves, we shall before long, in all the settled districts at any rate, be growing ten sheep for every one formerly grown. (Cheers.) We shall then keep the Adelaide market better supplied with sheep and lambs, and we shall see the export trade growing to very large dimensions. Someone said to me—"You are putting up the prices. The people will have to pay more for their meat, and I cannot understand the Labor Party supporting a Government which does that." Exactly the same argument was used in connection with the butter bonus, but we all know that nothing of the sort happened. To-day we never see good butter down to 4d. per pound, but then it never goes up to 2s. 6d., as it used to do. The difference is that the price is more steady all the year round and both the producer and the consumer have benefited. (Cheers.) The same thing exactly will happen in connection with the lamb trade. When ten farmers are keeping sheep for every one who does so now the Adelaide market will be better supplied with sheep, and the price of mutton be more even all the year through. Last year we exported about 40,000 lambs, the year before only about 4,000. That is a marvellous increase for one year, and a complete answer to those who have been criticising this department and saying it has not paid. Would it have paid under private enterprise? I know it would not. Why, for the last three years we have been suffering from a drought unprecedented in South Australia. Was it any fault of the department that through this drought the butter export fell from 500 tons a year until we had actually to import butter to supply our own population? Directly we get anything like good seasons the Produce Export Department is not only going to pay working expenses, but a fair interest on the capital expended on it as well. (Cheers.) The total loss on the department during the six years it has been established, including interest on all the money spent on it, has been £4,000. That has all been paid out of general revenue, and this small amount has firmly established a department that has done more to assist producers than any other. (Cheers.) I think you will agree with me that that money has been exceedingly well spent. (Hear, hear.) The debit balance for the twelve months ended June 30th, 1898, was £710. This year—with a better season and some little alteration in our scale of charges—we came out for the first time since the department was established with a credit balance of £65, so that we may congratulate ourselves on having turned the corner. (Cheers.) This result was obtained after having paid the whole of the expenses of the works at Port Adelaide and the whole of the Adelaide office expenses, and in spite of the fact that we handed back to shippers of lambs in value of fat £600 we might have retained. If we had kept that sum the department would have made a profit of 3 per cent. besides paying working expenses for the twelve months.

I was very glad to see that even in such a dry season we exported 166 tons of butter last year. We are going to do much more than that this year. The trade is only beginning again, but it is going to go ahead rapidly I hope. Some little fault has been found with me because I raised the charges on butter by 1s. 6d. a ton, which represents the cost of putting it on board the steamer, including wharfage for all the stuff which passes over our wharf. Those who have read the speeches of some of the members of the Opposition, and especially of Mr. Darling, will have noticed that they, and he above others, complained that we do not make the department pay, and that we have got a wharf worth so much which ought to return interest on the cost. I decided, therefore, to ask the producers to pay 1s. 6d. a ton for the use of this fine wharf, and I do not think it is a charge anyone can reasonably complain of. I shall be reminded that the Victorian Department does the work cheaper, but they have a much greater quantity to deal with than we have. Besides, in addition to a charge of 2d. a box—which is now raised to 3d.—the railways charge Victorian shippers 4s. 6d. a ton for taking the butter from the depôt to the wharf. I do not think, therefore, that our charges are too heavy. Directly our profits are enough to cover anything like 4 per cent. interest on capital over working expenses I shall be ready to consider the question of reducing the charges. That is where the advantages of the State having the department come in. In a deparment carried on by private enterprise you could not expect such a reduction; but we have no shareholders to whom a profit has to be paid as in a company. What we do is to run the thing at the lowest rates possible for the benefit of the producers. (Cheers.) I anticipated this year that if the season continued as propitious as it was till the end of July that we should have 80,000 or 100,000 lambs and sheep to export, as against 40,000 last year. I do not know now whether my anticipations will be realised, but we are doing very well so far. I believe a very large quantity of lambs were bought at the Adelaide market this morning for shipment. Up to this date last year we dealt with 1,104 lambs and 375 sheep. This year, without reckoning the result of to-day's market, we have already received 7,523 lambs. Last year we received no butter before September 17; the first shipment was on September 22, and this year we have received over 66 tons already. With regard to our apple trade, the Government have resisted any attempt to modify our regulations against the sale of diseased fruit, because we believe that if the codlin moth cannot be altogether banished from the country it can be kept down if we use vigorous measures. If we allow the sale of infested fruit the result will be that very little trouble will be taken to eradicate the pest. I hope in this matter we shall have the support, not only of residents in the city, but in the South-East and at Angaston, Clare, and other places, and I am pleased to know, through petitions which have been received, that the fruitgrowers seem inclined to resist the abolition of the regulation. Some of the largest growers in the Gumeracha district and at Angaston are against any change, and say the Government are perfectly justified in their action, and if we want to preserve our export trade we must prevent the pest from spreading through the colony. The prices we have been getting in the London market for our apples have been very remunerative. Last year and the year before last were record seasons, and the average price realised was 12s. a case net. Of course we cannot expect that always, but this year, except for one unfortunate shipment by the *Narrung*, which was carried at too high a temperature, we have realised from 6s. 6d. to 11s. a case net to the growers, not including the case. I hope soon to be able to arrange for a very considerable reduction in the charges for shipping apples; but as long as we have shipping rings this is a very difficult matter. To show you how these rings work I may mention that up to June of last year we paid 14s. 3d. per ton for coal for the Export Department. Now, owing, as I understand, to certain shipping firms putting their heads together we are paying 19s. 6d. a ton. That means that I have got to provide £200 extra for coal this year, and that is a very serious item in the working of the Department. I am not going to advocate the Government going in for ships—just yet at any rate. (Laughter.)

A DELEGATE: You ought to.

The MINISTER OF AGRICULTURE: Well, as long as there is healthy competition no doubt things will be all right, but once these gentlemen put their heads together the producers suffer, and that is all wrong, (Hear, hear.) When I was in New South Wales in February I saw a wheat-testing mill at work. It is kept going testing the milling qualities of wheat pretty well all the year round. I thought when I saw it that it would be a good thing to have at work in South Australia. (Cheers.) As a producer I have very little knowledge of the milling qualities of wheat. I do not suppose you have either. The Government therefore are going to establish one at the School of Mines. We have already ordered one, and if anyone wishes to have wheat tested he can send samples to the School of Mines for the purpose. In connection with another of our great producing industries we have made Mr. Quinn, who is a most energetic and able officer—(cheers)—Horticultural Instructor. Those who take the *Journal of Agriculture* will see in it every month splendid articles by Mr. Quinn, and will realise that he is doing a very good work for South Australia in this direction. He has lectured in various centres during the past twelve months, and he is always glad to go anywhere if he can help fruitgrowers. (Cheers.) We are getting on very well also with the typical orchard at Mylor, which is under the direction of Mr. M. Holtze. This year he is planting out various trees from the nursery, and in the future we shall be able to know when we are buying fruit trees whether they are of the varieties they profess to be. I had the pleasure yesterday of moving in the House of Assembly the second reading of the Phylloxera Bill. Those who are interested in our vine-growing industry will recognise that it is of vital importance to keep the phylloxera out of South Australia if we can, and I believe the Government in this matter will have the support of all parties in the House The Bill has been most carefully considered by the vignerons, and, though they do not perhaps agree with every part of it, they agree that it is much better than when it was first proposed in 1897. In this matter we have had the valuable advice of Professor Perkins, who, I believe, has the confidence of every vinegrower in South Australia. (Cheers.) He is a gentleman who has had a good education and who is never afraid of any work he is asked to do in connection with his department. He has attended meetings and met objectors in various parts of the colony, and has done a great deal towards perfecting the measure. Now for a few words as to the Bureau. I am pleased to know that the number of

Branches and of members is increasing. I believe that the more we farmers meet together to discuss various matters connected with the industry in which we are engaged the better it will be for ourselves and the better it will be for South Australia. Ten heads are better than one, and I do not agree with Mr. Rounsevell that it is necessary to establish experimental farms in all parts of the colony because I recognise that the Bureaus are doing that work very well. I read the *Journal of Agriculture* carefully every month, and I am much struck with the evidence shown by the reports of the meetings of the Branches of what they are doing. It is a very good thing that we are able to tabulate in the *Journal* the result of their experiments during the year. They are most valuable, and as one who has largely used manures I have derived very considerable benefit from reading these reports of meetings of farmers who gather together to discuss this new departure in connection with the agricultural industry. (Cheers,) Last year as a trial I put in a crop, portion of which I treated with 80lbs. of superphosphate to the acre and the rest with 200lbs. of Thomas phosphate. On the portion manured with super. I should have got at least a ton more of hay per acre than from the other, the crop being 1ft. higher, but when I came to reap it I found that the Thomas phosphate yielded the best by quite a bag to the acre. My experience was that Thomas phosphate can well be used on clay land. The Government do not want to interfere with private enterprise. In everything they have done their aim has been rather to stimulate it, and the establishment of the Export Department has largely assisted to that end. Look at the frozen meat and fruit export trade. For the first two years the Government were left severely alone, and the cry was —"You are throwing away the taxpayers' money." The merchants did not trouble to do as they are doing now—sending all over the country to try to buy up produce for export, and the result, as I said, has been to stimulate private enterprise. Still I am more anxious to stimulate enterprise amongst the producers than amongst the merchants, and if we can get 25 per cent. more for our produce by giving a little State assistance we benefit not only the producers, but the whole of South Australia I do not know whether you think I am exaggerating—I hope you do not—when I say that the Export Department has very largely added to the producing—I do not now refer to speculative—value of all land in South Australia fit for growing lambs, butter, wine, and fruit. I believe that the department has added 10s. per acre to the producing value of two million acres of South Australian land, and it has done this by opening up a fresh market for the disposal of our surplus produce and by giving us a knowledge of the prices our produce makes in London. It has raised the price of lambs from an average of 6s. to an average of 10s. A man I know got 11s. 9d. for some lambs, and he admitted that not long ago he got only 5s. for the same class of lambs from the same buyer. He is a political opponent of mine, and I said to him, "That is not a bad result of the work of the Export Department." He replied, "Oh, private enterprise would have done it." But you know very well it would not. I hope the farmers will stand by the Government and the institution, and they may be sure that the Government are only anxious to develop the industries of South Australia and make the great masses of the people happier and better and more comfortable. (Cheers.) I thank you very sincerely for your patience to-day, and I hope I shall have the pleasure of addressing you next year again. I have very much pleasure in declaring the work of this Congress open, and I hope the result of your deliberations will be that we shall all be wiser for the discussions we are going to have and that we shall part as we met—the very best of friends. (Loud cheers.)

Mr. W. J. VENNING (Crystal Brook): Is the new testing mill on the Hungarian principle, or is it a new invention?

The **Minister of Agriculture**: I do not know anything about the Hungarian principle. I am not a mechanical expert, and I should be sorry to show my ignorance by trying to explain it.

Mr. W. C. **Grasby**: I move that our hearty thanks be accorded to the Minister of Agriculture for the very able and interesting address he has given us. I think the best remark I can make is to ask you to carry the vote quick and hearty.

Mr. T. **Hardy**: I second the motion.

The vote was given with acclamation.

The **Minister of Agriculture**: I thank you very heartily for your vote of thanks. I shall be very glad to meet you, not only here, but in your own districts, and I hope I have not said anything that will offend anyone. I am only anxious to show that I am worthy to hold the position of Minister of Agriculture. I think I shall be failing in my duty if I said anything to discount the work done by the producers of the colony. It is a most valuable work, and I hope we are going to have a good season to reward them (cheers). I hope during the next few years the prospects will continually improve. (Cheers).

The **Chairman**: I am very sorry to have to announce that Mr. Samuel Goode and Mr. Henry Kelly have written to say that they will be unable to attend our meetings, owing to ill health. They trust you will have a good attendance and good meetings after such glorious rains. (Cheers).

Chairman's Address.

The **Chairman** (Mr. F. E. H. W. Krichauff) read his annual address. With a further increase of its Branches, the continued good work our Agricultural Bureau is doing can hardly be doubted. Most of the 105 Branches are at least quite as active as they have ever been before. This shows that it is not an ephemeral desire of a few persons to meet in a locality, and to bring a little variety into quiet country life. To obtain the *Journal of Agriculture and Industry* free cannot be sufficient remuneration for long rides to the place of meeting, as has been asserted by some to be the object of the formation of many of the Branches; and, if true, it would still more prove the intrinsic value of a publication of which we may well be proud. But the members have found their meetings to be not only of considerable interest and profit to themselves; they are also unselfish enough to be willing to assist their brother farmers and others with their varied experience, far and wide.

There has been no change in the membership of the Central Agricultural Bureau, but we have again lost a number of valued members of Branches by removal or by death. I noticed of the latter, who had taken special interest in the formation and the work of their Bureaus, Messrs. C. H. Hussey, late Chairman, of Port Elliot; F. H. Artaud, late secretary, of Penola; R. U. Paris, late secretary, of Naracoorte; and James Mayfield, of Yankalilla. But agronomy all over the world has to deplore the death of Dr. Schultz-Lupitz, who tested theories on a large and practical scale by purchasing a most miserable and sandy tract of land, which he was thoroughly successful in making fertile enough to grow fine cereal and other crops. Of him, said C. M. Aikman, M.A., and Professor R. P. Wright, of Glasgow, in their treatise on "Potash Manuring," in 1896—"The famous experiments of Dr. Schultz-Lupitz, in Germany, based on promoting the growth of nitrogen-collecting (leguminous) crops by the application of liberal quantities of potash and phosphatic manures, enriched soils not only in these minerals, but also in the nitrogen collected by these crops from the air, and thus succeeded in converting poor and barren soils (without the application of expensive nitrogenous manures) into soils of fine fertility. It would be difficult to exaggerate the importance of this discovery for the future of agriculture. He has already shown that a good crop of clover (or other legumes) may not only assist the growth of one particular crop, but also raise more permanently the condition of the soil, and thus to convert worthless soil into fruitful fields."

I can leave most matters of interest to your study of our yearly report to the Honorable the Minister of Agriculture and Education, and I will only make a few remarks on such, to which I desire to call your special attention. Our farmers and graziers have suffered great losses of cattle and sheep from dry seasons, but these might have been much reduced if proper means had been taken of saving feed in better seasons. Straw and chaff have been wasted, ensilage has not been preserved, and the land has perhaps been so overstocked that grasses and other plants could not seed. Our own grasses rival, at least in nutritiveness, those of any we might try to acclimatise, and our saltbush is apparently even more valued, and certainly more cared for, at the Cape of Good Hope and in California. Enthusiastic correspondents write "that the Australian saltbush will be worth more to California than all the money the experiment stations have cost from the beginning." One experimental station alone collected and distributed in 1896 1,500lbs. of saltbush seed, and thousands of acres were sown in 1898. Unfortunately, however, many of our native grasses, and other nourishing plants on our pastures, are annuals. and consequently depend mostly on yearly seeding. Without an occasional rest for such seeding our pastures must deteriorate greatly, and we may find them almost ruined by close feeding. Even some perennial grasses, such as the previously widely-spread kangaroo grass, are more and more disappearing on that account. While it has been very desirable for the Agricultural Bureau to obtain seeds of perennial grasses and of other fodder plants for experiments, and these have been distributed so far as supplies would go, there has been lately but little success on account of the adverse seasons. It is therefore all the more necessary to raise a warning voice for the protection of our indigenous vegetation, which is hardier against our droughts. New perennials, however, are desirable. Most of our grasses are now annuals; they spring up quickly after rain, but die off very soon after our spring, and give, therefore, only a nutritious but dry feed during early summer. Only while the grass and other plants are green and succulent they are most excellent for the milk supplies of our dairies—and our farmers have to rely on dairying to help them over such times when the price of grain is low. More systematic efforts should therefore be made to grow succulent fodder for their cows during the long summer. Private enterprise and our globe-trotters might assist the Bureau in introducing such plants or their seeds, and I hope that a determined effort will be made to cultivate Modiola decumbens, so much praised in California as a good milk-producing food on alkaline soils as well as elsewhere. In the United States and other countries considerable donations and legacies are left to experimental stations, for which our Bureaus are feeble substitutes, but here we have to depend entirely upon a variable, and hitherto quite insufficient, parliamentary grant. Some of our Branches have attempted experimental plots, kept at the expense of the members. Others would follow suit if some assistance could be given. Here is an opening for some of our wealthy colonists to show their public spirit and desire to lastingly benefit the province from which they have obtained, or where at least they have made, their wealth!

It must be admitted that we have some plants, which were long ago introduced, and are answering well for the moister parts of the province, but they are not nearly so much cultivated as they deserve. Amongst them lucerne takes the first place. How many hundreds of acres after all are there outside a radius of twelve miles from Adelaide upon the green of which your eyes can rest with pleasure, when all else but the undesirable stinkwort looks dry as in a desert? Where do we see sainfoin (Esparsette), and where are the clovers, the rye grass? Where any large quantity of Jersey kale, that produced such large returns at the Roseworthy College? Beets are also grown by a comparatively small number of our dairymen. Even the more precarious crops, as maize, dhurra, the various sorghums and millets, should not be neglected to be sown as soon as good rains seem to allow their successful culture for summer feed.

Scientific manuring requires more than ordinary intelligence. It is necessary to carefully study, not only again and again, modern experiments on the subject of commercial manures, but also to observe and obey the laws of nature, which experience and experiments will teach the farmer. Thus only can he feed his crops in an intelligent and economical manner. With either virgin soil or one not previously manured, I think it is fairly easy to apply the rules which govern manuring up to date, and to maintain permanently, or increase the fertility of a farm, from the cultivated part of which plant food is annually taken in the shape of hay, grain, and roots, and by grazing, when you obtain milk and cheese, and run live stock. To help you in any experiments a crop of grain, or of fruit, may give you valuable suggestions. You may pretty well take it for granted that your crop wants nitrogen if the plant's leaves are of a pale-green color, with small growth of stalk or of branch; but a brighter and deep-green color and fairly vigorous growth does not necessarily indicate that more nitrogen might not increase the crops, so long as an equivalent of the two other plant foods is present. A sufficiency of phosphoric acid is indicated by an early-matured crop of grain with plump, heavy kernels. A full supply of potash causes luxuriant growth and fine-flavored fruits. Of course the mechanical condition of the soil should be equal and perfect where comparisons are made. We should not forget that different plants may prefer the same constituents in another form, or at least different quantities of one or other of the plant foods. Wheat and asparagus, for instance, give better crops when nitrogen is applied in the form of nitrate of soda than in any other form, and the quality of tobacco is spoiled by muriate of potash, for it demands potash in the form of sulphate. Potatoes also—although frequently manured, and giving good crops, with muriate of potash—are far better with sulphate of potash.

The value of fallowing is of late years explained. not merely as a consequence of the cultivation opening up of the soil to heat, air, and moisture. The fallow gives to the bacteria of the soil the very opportunity of rapidly increasing in numbers through the before-mentioned physical improvements. Mr. Caron found, after fallowing argillaceous soil in a high position, four to five times more bacteria than in an adjoining wheat field. And this is not to be wondered at if we learn that one bacterium, through division of its one cell into two, may produce in one day a progeny of sixteen millions, or that in one gramme of a cultivated, moist, sandy soil, somewhat rich in organic matter, Professor Koch found 380,000, and, in a loamy soil, up to half a million. Large numbers of certain kinds of bacteria improve the soil, and it is noted that the useful seem to prevail over the noxious whenever the soil is fallowed. The contrary must be the case where the same plant is cultivated on the same field year after year. A field had fair wheat for two years, was poor on the third, and bore hardly any crop at all in the fourth year, although fed with all the necessary plant food. After a fallow it gave, in the sixth and seventh years, a good normal crop. Experiments made at Göttingen Station showed also that after a fallow of only eight weeks of land that had received only phosphoric acid and potash, but no farmyard manure, for years a crop of rye was much superior to that on some adjoining plots not fallowed, although on these a previous crop of mustard, or a mixture of mustard and peas, or of peas alone, had been ploughed under.

We hear now more frequently of potato diseases in South Australia. These may appear from continued cultivation of the tubers on the same ground; but there is also no doubt that varieties more recently raised from seed should take the place of those cultivated for so many years, that are more liable to disease and also gradually less productive. I have therefore obtained sixteen of the latest varieties raised in Germany and Gallicia by the most renowned growers, and I have distributed thirteen of them in the first week of January, so far as about 200lbs. would go. Of the other three sorts I received only three potatoes each per mail. Although these thirteen sorts had to be planted at a very unfortunate time of the year, the results, so far as reported to me, have been rather cheering, and all growers are determined to grow them again at the proper time for planting potatoes. Reports about quality are good, and very good cooking, and no disease has been found except that some of the cut setts that failed were full of minute insects and worms at Lucindale. Mr. Ricks, of Cherry Gardens, reports 105lbs. from 7lbs. 3½ozs. planted, "Max Eyth" giving 24lbs. from 9ozs.; Mr. A. Wood, of Yankalilla, had from the same variety one potato weighing over 22ozs.; Mr. Feuerheerdt, of Lucindale, had 100lbs. from 7lbs.; Mr. Hannaford, of Cudlee Creek, 164½lbs. from a similar quantity, heavily manured, and actually 42½lbs. from ten setts of the variety "Professor Maercker," and 36½lbs. from nine setts "Professor Wohltmann."

Believing that phylloxera will shortly appear in South Australia, notwithstanding all precautions, I hope that the Bill will pass without delay, and that, although opposed by Professor Perkins, a quarantine ground for American resistant vines be established in Kangaroo Island.

I am glad that more attention is paid to tuberculosis, but there is another deadly disease—typhoid—precautions against which should not be neglected by those who have to draw their water from wells. Not that the water from our reservoirs is always of the best quality; but while a litre of air contains only from one to ten micro-organisms and a litre of well or river water from ten to 500 germs, there are from many thousands to millions of germs in a cubic centimetre of soil. Their number only decreases with depth, so that from 9ft. to 12ft. deep the soil is almost sterilised. We have, therefore, to prevent the water from rising in a well above that depth, except through tubes, and use a pump, keep the well closely covered up, and prevent infiltration from the surface by cementing the neighborhood. If this is not done filtration or boiling should not be omitted.

Our wine industry being of such importance, I had—after perusal of all accessible up to date French, German, and other publications and periodicals on "Manuring of Vines," previous to the excellent paper read by our viticulturist —compiled a pamphlet on the subject, containing also twelve plates, which prevented, by the non-arrival of the blocks, an earlier appearance. The plates show very sandy soil improved by a growth of Lathyrus silvestris, others how poor the crops are if either potash, phosphoric acid, or nitrogen is not applied, and how fine with all the three plant foods. Heavy manuring is also to some extent a panacea against diseases, and even phylloxera.

I hope there is no snobbishness in South Australia, which looks down upon agronomical pursuits as a vocation of inferior degree. Our uncertain climatic conditions more especially require an unusual degree of good judgment. Our young men aspiring to become farmers and gardeners have now the opportunity of attending agricultural schools and thereafter Roseworthy College. They and their elders can also subsequently visit the college, peruse agricultural papers and our *Journal*, that places all the newest agronomical scientific experiments at their command, by which they may doubtless become practically, and even more intellectually, elevated. Although many young men may drift from the country to the city, there are others inclined to take their place who will try to apply science to agriculture, and hope that this will lead to fair success, and at all events to a healthy country life.

On behalf of our Bureau you will agree with me we can lay claim to some of the advance made in an improved cultivation of our soil.

The CHAIRMAN: We have decided to dispense with votes of thanks until the end of the meetings, as they take up too much time after each paper.

Mr. VENNING: I move, that we have the heartiest sympathy with Mr. Goode and Mr. Kelly in their sickness. They would only be too pleased to be present, and I am sorry they cannot be here.

Mr. J. B. ROWE (Quorn): I second the motion.

The motion was carried unanimously.

The GENERAL SECRETARY: I am glad to know that the Japan clover, which is said in California to be one of the most useful plants introduced there, is spreading on a farm in the Port Broughton district, and I hope it will continue to spread.

Mr. BADMAN (Riverton): The Chairman has omitted to mention Johnson grass in his paper. I planted it a few years ago. Some people think it ruins the land for cultivation purposes; but after growing it for three or four years, I put in a crop and got hay 5ft. high. I delivered it in Riverton to a man who has during the past three years cut 10,000 tons of chaff, and he says nothing as good as my hay ever came into his mill. After I cut the hay I got a crop of Johnson grass 4ft. high, and my milch cows did well on it. It cannot be killed; but it does not spoil the land for cropping with wheat.

A DELEGATE: Was that with or without irrigation?

Mr. BADMAN: Without irrigation.

A DELEGATE: What was the hay crop?

Mr. BADMAN: Wheat.

WEDNESDAY AFTERNOON SESSION.

The Currant Industry.

Mr. THOMAS HARDY: I have had many years' experience in the growth of currant vines, and I know more about it now than I did twenty years ago; but there is still a good deal more to be learned It is possible that some of the members present have grown currant vines, and will be able to give information to supplement what I have to say in my paper:—

In May, 1880, I had the honor to read a paper on the currant vine before the Royal Agricultural Society, giving my experience in currant-growing up to that time; also what information I had been able to gather respecting the industry in Greece, and that was very little indeed.

The only writer I could gather any practical information from was Mr. George Maw, F.L.S., in an article in the London *Gardeners' Chronicle* of September 27th, 1877, but the description he gave of the methods of growing and harvesting the crop did not help us much, the conditions of land, labor, and climate being so different from ours in Australia.

In December, 1885, I was the first to give evidence before a Royal Commission on Vegetable Products in Melbourne, and the evidence I was able to give did much to start the industries of raisin and currant growing in Victoria.

I believe I was the first to plant a currant vineyard of any extent in South Australia, having planted thirty acres at McLaren Vale in 1881, which I have since extended to over 100 acres there, and my example has induced many others to follow and plant considerable areas, the soil and climate having proved to be most suitable for profitable production in that favored locality. During all the years since 1880 we had only our own experience to work upon, until about two years since our esteemed fellow-colonist, Mr. W. C. Grasby, F.L.S., the editor and proprietor of the *Garden and Field*, visited Greece to obtain all the information possible on currant-growing and other kindred pursuits, and the results are to be found in the April, May, and June numbers for 1898 of that paper, and give a most valuable and interesting account of the methods employed.

Among the most valuable items is that referring to winter irrigation, which I give in his own words, and which contains much matter for serious consideration for us in South Australia. :—

"Mr. A. J. Perkins, the Government Viticulturist, has tried to impress upon the vinegrowers of South Australia the need in this climate, with its long dry summers, of conserving the moisture of the winter months. I have just digressed to speak of the ignorance, poverty, and corruption of the Greeks. And yet there is a lesson to be learned from their winter treatment of their vineyards which, I believe, would be worth a prince's ransom to our vignerons. The people of these old countries, with all their primitive ideas and customs, have the inherited experience of fifty centuries, and not absolutely for nothing. I have shown how scanty is the rainfall and how long and dry are the summers. . . . . The success of the currant vineyards is very largely due to the care which is taken to prevent any waste of whatever rain does fall in the winter, and, where possible, supplementing this by directing the surrounding drainage and mountain torrents on to the vineyards in winter. It is the custom to open up the soil around the vine in the beginning of the winter, so that it will stand as it were in a saucer. A vineyard so treated will have the appearance of a collection of circular holes about 3ft. across and 1ft. or 15in. deep, in the centre of which stands a vine. I can understand that, although the rainfall there may be only 16in., these vineyards have an equivalent of 25in., but all in the dormant season."

Another paragraph well worthy of quoting is that relating to trees in or near a vineyard:—

"The great point is that no trees of any kind should be planted in a vineyard, and that it should get plenty of sun, and that the air should circulate freely around it."

An interesting description is given of the process of ringing, or taking off annually a ring of the bark round the stem of the vine during the blossoming, which is done to improve the bearing of the vine and the size of the fruit, and which will, no doubt, be tried by many of our currant-growers this season. The descriptions given of the methods of planting, cultivation, and the drying of the crop, are highly interesting, and give rise to much thought as to how far we may be able to adopt any of them, having regard to the different conditions under which we labor. I am still of opinion that we shall have to work out our own salvation in the future, as we have done in the past.

I will now proceed to show what our experience has done for us so far in improving the methods of cultivation and havesting during the past twenty years, and will begin with the most important:—

The Soil and Climate.

The best soil we have found so far is the rich alluvial flats, if well drained. They give an abundant growth of wood, so necessary for forming the vine in as short a time as possible. Such land will take a somewhat longer time to give a full crop than lighter hillside soils, but will most probably yield finer fruit, and be more lasting. Still, good results have been obtained from some good deep hillside land with a clay subsoil and soft limestone below that again.

Wherever possible, either flats or hillsides should be sheltered from the cold west and south-west winds, which interfere with the setting of the fruit; and it is also desirable to have shelter from the hot north winds, which do much damage to the fruit when ripening. Of course shelter from both cold and hot winds may in many places be got by planting belts of quickly-growing trees and shrubs, but they must be never nearer than 100ft. from any vineyard, and then there is always the disadvantage from them that they are a harbor for birds, especially the sparrow and starling, both of which are very fond of the currant grape, and, if not well looked after, do a great deal of damage to the crop.

In my paper of 1880 I advocated, and afterwards practised, the planting of wine and raisin grapes between the currants, with the view of getting a paying crop from them in a shorter time, but it is now considered by most people that it is better to confine it entirely to the currant, it having proved that it takes less time to get a crop of currants than was at that time thought necessary, and that in some land the vines commence to bear in five or six years a crop that will pay all expenses of cultivation, and go on increasing to produce crops yearly after that (barring hailstorms) which will well repay the owner, as I shall be able to show later on.

It has also been said by some that the mixture of other grapes among the currants is the cause of the large berries having seeds in them, from the inoculation by insects, but this has not been proved at all conclusively.

Trellising.

The greatest improvement made in the cultivation of the currant vine of late years has been in the methods of trellising. It was very early found that, grown and pruned like other vines, very few grapes were got from them; also, that they did much better where trellised, so that the fruit hung clear of the foliage, and wherever the fruit was too much enclosed by luxuriant foliage (as often happened in an ordinary trellis) that plenty of bunches formed, but very few set their fruit.

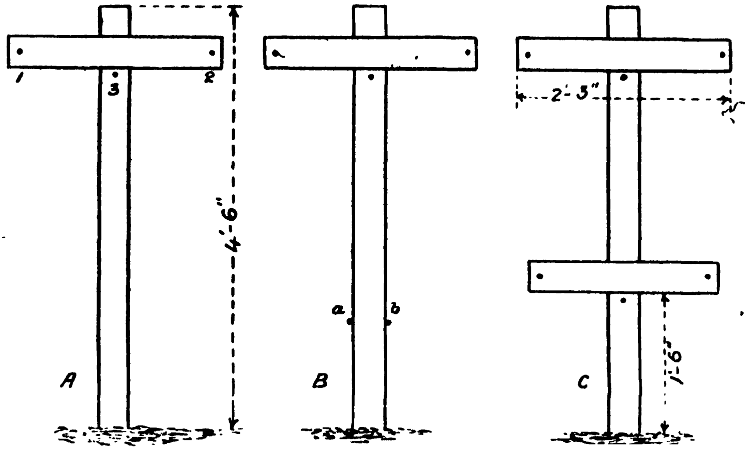
This set me to modify the form of trellis, and to adopt the T head, or overhanging form, and that is now generally adopted in the McLaren Vale vineyards, and is well illustrated in the very excellent book on "Pruning the Vine," by Mr. A. J. Perkins, the Government Professor of Viticulture.

The latest development is one which I suggested some years since, that is, to have a top and bottom tier, training the vines alternately on each, the object being to get more room for training the vine.

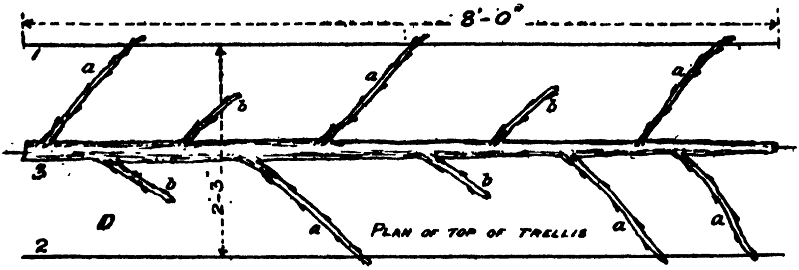
Mr. Fred. Lowe, of McLaren Vale, has quite a model vineyard on this plan, and so far the lower tier seems to bear quite as well as the upper one.

The posts used are about the usual size for post and wire fences, but should be not less than 5ft. out of ground. The top cross heads 27in. long, of split wood, about 2in. x 4in., and bolted on as near the top of the posts as possible. The bottom cross head may be a little shorter, say 24in., and not less than 18in. from the ground. Three wires for each tier are used, the middle one as nearly level with the outer ones as possible, and of No. 8 wire, as it has to bear the greater weight. No. 10 wire is used for the others. The posts should not be more than 30ft. apart. We found that with the posts at 60ft. apart the weight of the vines and fruit was too great.

It is very necessary to have good heavy posts for the ends of the rows, and to put them 3ft. in the ground, and have them well strutted.



No. 1, showing trellis posts and cross-heads—A shows the single tier; 1 and 2 are the outer wires to which the long rods are carried alternately; 3 shows the centre wire to carry the main arms; this wire must be brought as close as possible to the cross-head. B shows at *a b* where wires were placed to carry the intermediate wine grapes referred to in paper. C shows post with double cross-pieces, the lower one being several inches shorter than the top one. Owing to an error in the drawing the cross-heads appear about 4in. below top of post, whereas they should be bolted as near the top as possible.



No. 2, showing method of training currant vine to wires—The main stem is trained up to the right and left and taken along the middle wire (3), the long rods (*a*) being taken alternately to the outer wires, and tied with No. 22 black wire, any buds beyond the wire being cut out. The object of these long rods is to steady the vine. The short rods (*b*) usually bear as much fruit as the long rods.

I might explain that the simple method now adopted is to place a wire close to the cross head, to prevent the shoots growing upwards. By having a wire close to the cross head the long shoots will go in a circular direction, with the ends pointing downwards. This is an important fact, which has been found out by experience.

As soon as possible the main stem of the vine should be formed and taken straight up to the middle wires by a light wattle stake or bamboo cane. If it is allowed to sag, or go on one side, instead of forming a prop to keep up the vine, it will do the opposite, and tend to drag down the trellis. And the sooner the frame of the vine is formed the better; therefore the main arms should be encouraged to get to the full extent required by suppressing the side shoots. The cost of trellising, if done in a substantial manner, is in any case a heavy one, and to do it in any other way is false economy. The figures I give below are open to revision, and it will depend a good deal on whether there is plenty of timber fit for posts on or near the vineyard, also on the market price of wire.

For one acre of vines it will take—

	£	s.	d.
118 posts at 6d. each	2	19	0
11 straining posts at 1s.	0	11	0
11 struts at 6d.	0	5	6
123 crossheads at 10s. per 100	0	12	3
5¼cwts. of wire at 10s.	2	12	6
30lbs. bolts at 3d.	0	7	6
Labor erecting	3	1	6
If two tiers, extra	4	10	0
	£14	19	3

Distances for Planting.

The best, I think, in good strong land is 12ft. between the rows, and 10ft. between each vine in the rows. This, with a top and bottom tier, will give a spread of 20ft. for each vine. This allows ample room for cultivation, and for a dray to pass between the rows for gathering the crop or manuring the vines when required.

In my first planting I put in the currant vines 24ft. apart, and planted three other vines for wine grapes between, with the view of getting a quicker return than from the currants; but we now find that the latter require more support, and have begun to take up the intermediate ones, leaving one instead of three, and that also will have to go before long; but we have had the crop from them for fourteen or fifteen years.

Grafting Old Vines

with currants has been tried, but has not always answered expectations. I unfortunately planted a good many acres of the Corinth variety, but found that they did not bear anything like so well as the Zante. Then I attempted to graft the Zante on them, but the result was a complete failure, and some grafted on the Muscatel were not much better with me, but they have done well on the Pedro Ximenes, and may do well on other kinds that I have not seen tried.

Results.

I am able to give from actual records kept of the yield of one of our mixed currant vineyards, measuring 8½ acres, for the past nine years, and the cost of working for seven years, the following balance-sheet:—

Average yield of currants per annum, 15 tons 4cwts. 2qrs.; average yield of wine grapes per annum, 15 tons 5cwts.; average cost of working and delivery of crop to the drying ground, three miles away, £70 10s. 5d.; allowing 3½lbs. of fruit to 1lb. of dried, the vineyard annually yields 9,744lbs. of currants, at 4½d., £182 14s.; deduct ½d. per pound for drying, cleaning, and bagging, £20 6s.=£162 8s.; add value of 15 tons 5cwts. wine grapes at 40s., £30 10s. Total return, £192 18s. Deduct cost of working as above, £70 10s. 5d. Leaves a profit of £122 7s. 7d. This works out at £14 8s. per acre. This, it will be seen, does not take into account the cost of getting the vineyard into bearing, the value of the land, or interest on the original outlay, which cannot be reckoned at less than from £15 to £20 per acre.

I believe it to be quite possible with a vineyard planted to all currants, and well cultivated, to obtain a ton per acre of dried currants on an average, after they come into full bearing, and, unless the present duty of 2d. per pound on the imported article is reduced by the Federal Parliament (and that, I trust, is not likely to happen, as currants hardly come on with kerosene for the "free breakfast table"), that the price will not average less than 4½d. for many years, and will yield a handsome return for the capital and labor employed.

under a Federated Australia will absorb, at the present population, including New Zealand, not less than 7,000 tons of currants annually to supply the demand, and at 15cwts. to the acre would take, say, 9,500 acres to produce, the whole of which should be grown in South Australia and Victoria, as being best adapted for it. It is not likely that an outside market will be required for very many years, and we know that the currants grown in South Australia are preferred to the imported article, and sell at a higher price; and currant-growing is an industry which may be carried on by the smallest blockholder. Even with a single vine around his house he may produce sufficient for the family use, besides having the comfort of its shade in the hot summer days. The only drawback that I can see is the fear that phylloxera may come to us; but we have been fortunate enough to keep it out for over twenty years, and fervently hope that we may be able to do so for many more years to come.

Mr. Hardy continued: Of course it depends a good deal upon the growth made made by the vines whether they will bear as much fruit on the long rods as on the shorter ones. In some years they make much more growth than others. During the past year they have made exceedingly short growth, and some people have pruned their vines almost back to short spurs.

The Chairman: Will Mr. Hardy tell us the space occupied by the large currant vine at his house.

Mr. Hardy: About 1,500 sq. ft. It is exactly three-quarters the size of the celebrated vine at Hampton Court, which goes 2,000 sq. ft. according to the measurement taken by myself while I was in England.

A Delegate: Does Mr. Hardy think the vines would do well in the hills districts and do the remarks in his paper apply to those districts?

Mr. Hardy: I have known vines to be grown up in the Barossa hills, where they seem to do very well. Mr. E. Hague, of near Angaston, told me that he got 16cwts. to the acre; indeed, I do not know whether it was not a ton to the acre.

Mr. C. Ricks (Cherry Gardens): I have found the vine to do very well in the hills. In one season I got 12lbs. of currants from one vine, and I considered it a very high return. Since then I have always grown a few vines.

Mr. Hardy: In Greece it has been a common practice for some years to make an incision round the stem, about a quarter of an inch in width, right through the bark, the object being to cause the vines to bear more and larger fruit. I have some photographs, which Mr. Grasby lent me, which demonstrate this practice.

Mr. Showell: How old were the vines before the nine years mentioned in Mr. Hardy's paper?

Mr. Hardy: A portion of the vineyard, perhaps about four acres, was an old vineyard when we took it up in 1882. We grafted every fuorth vine in that portion of the vineyard on to Zante currants, and the other portion was planted in 1883. The vineyard is now in full bearing, and has been for some years. I think I have given a fair average for the past nine years. In one year we got 20 tons of currants and 20 tons of wine grapes; but, taking the average for the past nine years, the quantity given in the paper is a fair average of what the vineyard has done while in full bearing.

A Delegate: Do you recommend the vines to be planted in the hills, near Woodside, or is the climate too cold.

Mr. Hardy: I referred to the McLaren Vale district.

The Chairman: Vines were grown in the Bugle Ranges before 1864. That is a similar climate to Woodside, and I have no doubt they would do well at Woodside.

Mr. Bauer: I do not think the climate of the Woodside district is very different from the locality of Mr. Hague's garden, which is about five or six miles south of Angaston, in the Tanunda Range.

Mr. Hardy: One great advantage of the currant vine is that the fruit ripens early, making it quite possible for it to be grown in the hills districts.

Mr. J. W. Dall (Nantawarra): A disease is infesting one of my vines, and I do not know what it is. There is a sort of bluish tint noticeable on the fruit. What I would like to know is whether it is possible for this to be caused by the fact that the vine is growing in connection with the building.

Mr. Hardy: It is most likely that the vine is affected with oidium, the remedy for which is sulphur. It is not caused by its contact with the building.

Mr. Trimmer: I have noticed some beautiful currants growing in the hills beyond Gumeracha.

Mr. Hector: Can Mr. Hardy tell us what the rainfall is in the districts in Greece in which they grow Zante currants; what is the elevation; whether they are subject to any hot winds; and in what aspect do they plant the vines—are they near the sea coast or in sheltered positions?

Mr. Hardy: I did not visit Greece, but Mr. Grasby did, and the whole of the information asked for will be found in his writings.

Mr. W. C. Grasby: The information was published also in the *Register* of February 2 and 9 of 1898. The average rainfall at Athens, which is not a currant district, is about 14·9in., but records have not been kept there very long. I think that the districts in which currants are grown have a somewhat higher record than this. In Patras the average is about 17in. or 18in. The average number of wet days was stated to be about seventy-five in the year, whereas we have about 128 in Adelaide. The highest temperature for sixteen years was given as 106° Fah. in the shade, and the lowest was 14° Fah., which is 18° below freezing. The shade temperature during the drying season is usually about 86°. Their lowest record is about 11° lower than ours, and their highest about 7° lower than ours. The heaviest rainfall occurs in the three months November, December, and January, and they get thunderstorms occasionally from June to October. The climate is more moist than ours, and they are not subject to very hot parching winds. I have seen currants growing where the waves of the sea in very rough weather would splash over the vines. The culture of currants is confined to the low lands surrounding the coast. The best currants are known as Vostizia currants, which are grown along the Gulf of Corinth. There are one or two small vineyards to the north of the gulf and a number round the west and southern coasts of the Morea, but in no other part of Greece. It is a firm belief amongst the Greeks that the vine will not grow anywhere else. The incision round the vine is made with a special knife, and it is done for the purpose of promoting the growth of the fruit. The practice has been adopted for about nineteen years. I do not think any currants are grown up to as high as 1,000ft. Nearly all are confined to the plains, and I do not think there are any currant vineyards in the hills.

Mr. McLean: Will Mr. Hardy tell us which, in his opinion, is the best method for drying currants?

Mr. Hardy: I did not refer to this question because I thought it was generally understood. We use the oregon laths, which, I think, is the cheapest material. It was a very simple operation. Last year we actually dried currants in two days.

Mr. Fisher (Tatiara): A grower in Bordertown dries three or four tons and supplies about two or three tons of raisins to our local storekeepers.

The General Secretary: Has Mr. Hardy ever tried the sugar baskets for drying purposes? I have for a long time had an idea that they could be utilised with success. They are very light, and cheaper than wood.

Mr. Hardy: No; I have never tried them.

Mr. Showell: A critical fortnight for grapes at Renmark is the last week in October and the first week in November, and I would like to know whether the difficulty is likely to decrease as the vines grow older, or whether they will always have this trouble? The Sultana vine is stronger than the currant to stand the hot winds.

Mr. **Hardy**: That is one of the things which we must find out by experience. No doubt the trouble will still continue at Renmark and Mildura. We know that the currant vine is somewhat tender, and liable to be damaged by rain. I am glad to know that the Sultana is stronger than the currant. The best place for the currant vine is the favored gullies in our hills.

The **Chairman**: Did Mr. Hardy find last year, which was exceptionally bad in the destruction of vines owing to the wind and hail, that the vines planted north and south suffered more than those planted east and west?

Mr. **Hardy**: The grapes on the vines on the west side did not ripen so evenly as they did on the other side on account of their having been battered about by the hail.

The **General Secretary**: Mr Hardy states that in making a shelter from the wind it must not be within 100ft. of the vines. A few days ago I saw a shelter which, at one time, interfered with the vines; but the grower had dug a trench alongside the trees (sugar gums), and the shelter does not now interfere with the vines, though only 20ft. away. The same thing is happening down at Yallum. The trench is about 3ft. deep, but there is no need to cut it so deep in a drier district.

Mr. **Casely** (Mount Remarkable): It is very undesirable to have wattle stakes in a vineyard, because of the white ants, which take to the wattle, and, when they have devoured it, make for the vine. Pines act admirably.

The **Chairman**: Will Mr. Kimber, of Clare, tell us something about his district.

Mr. **Kimber**: There is not much to say. We have used wattle stakes, and find that they answer very well. We are about 1,400ft. above the level of the sea We have realised up to £100 value per acre, and that will give a good idea of what we get.

Mr. **Hardy**: Judging by my experience, you cannot expect more than a ton to the acre, and it must be very well cultivated to get that.

Stowing and Keeping Potatoes and Onions.

The **General Secretary**: Mr. McKinlay, of Mount Compass, who is not able to be present, has requested me to read a few of his remarks to introduce a discussion on this question. Mr. McKinlay says:—

> The experience gained by our members on this subject has been very much alike, and we would like to hear from others who have adopted different systems. In storing of potatoes for seed purposes, we recommend spreading out thinly on shelves, made of wire netting, in a very open shed, admitting plenty of wind, &c., allowing the potatoes to thoroughly green and throw short stubby shoots. Another plan that has been adopted is that of a low shed, about 4ft. or 5ft. high, with no sides at all, and the potatoes spread evenly on straw or dry rushes, In storing potatoes intended for eating purposes, the plan adopted by most of us is to heap them up on a perfectly dry place, thatch them over and cover with dry earth or peat, making a trench all round to prevent moisture rising (*i.e.*, our storing has all been done during winter months). In keeping onions, spreading them out in well-ventilated lofts and wire-netting shelves, similar to plan for seed potatoes. The information we would like to gain is, is there any better plan than ours, and would onions keep better if stored up in large heaps or between panels, about 6ft. between, with battens nailed on and space filled up with onions and thatched over? Our onions are generally kept from March until August or September; seed potatoes from June to October.

Mr. A. J. **Brocklehurst** (Pyap): The members of the Branch which I represent were anxious that this question should be brought forward, because it seems to us that it has been somewhat neglected. We have tried different experiments for storing and keeping potatoes. In the first place we tried the dry-sand method, with the result that the tubers kept fairly well and there was no sign of insect. Next we tried perfectly dry ashes. In May we put in about 3cwts, and on August 1st, when the potatoes were taken out, they were all sending off shoots and were ready for planting. They had been lying in the ashes for three months. Then we tried dry straw in a pit, and the result was practically the same as those which had been stored in ashes. The straw was covered with sheets of corrugated galvanized iron to keep out the moisture. The dark-room process was also tried. We placed the tubers in a room which was well ventilated and sulphured them freely, and the same satisfactory results followed. We found that the best results were obtained from those which had been kept in bags, though they were not so far forward when they were taken out. With the exception of the last experiment, all of the potatoes were rinsed in cold water and treated with Paris green and sulphur. Both treatments were successful in keeping away moths, &c. The tubers which were kept in bags had no special treatment whatever. Potatoes are grown under irrigation at Pyap. We have not yet tried experiments for storing onions. The fault seems to be that the potatoes are not kept long enough to have that growth that they should have before being re-planted. The only way by which we can be successful is for the growers to try different methods and furnish information through the Bureau, which will be printed in the *Journal*. We want to find out, not how to keep a few potatoes, but a quantity.

Mr. RUWOLDT (Mount Gambier): Our principal way of storing potatoes is to stack them away in bags. It answers well, and we have very few insects. We have planted 50 acres and found very few rotten potatoes amongst the seed. I prefer the medium size for planting.

Mr. J. W. DALL (Nantawarra): I have been following the plan adopted by an old gentleman who was growing potatoes in Clarendon for thirty years before me. He always stored his potatoes in the style known as "dug out." A great deal of the success in keeping the potatoes depends upon the care taken in selecting the seed. All who are accustomed to growing potatoes know that they are liable to get what are called "bastards," which are not successful potatoes to store for seed purposes, because they seem unable to produce potatoes. You should always be careful to get out as many of the "bastards" as possible. It is not wise to plant potatoes that have been left too long out of the ground.

Mr. FISHER (Tatiara): Our method of preserving potatoes is to spread them out and broadcast air-slack lime over them, using about 4bush. to the ton. We find that they do not shoot quite so early. Our experience in keeping them in bags was that they begin to shoot too early, and it takes away their strength. We would like to know which is the easiest and most economical method of preserving them.

Mr. C. RICKS (Cherry Gardens): We should have more change in seed. At one time everybody almost swore by the potatoes grown at Mount Gambier, but now they plant few Mount Gambiers, because their quality has run out. I believe this has been caused by planting this round seed. These bastard potatoes produce a large number of small potatoes, and they are planted again. The last year or two these potatoes, side by side with other kinds, have not averaged so much as the others by 1s. a bag. An instance of careful selection of seed came under my notice last week. A gentleman at Scott's Creek last season bought some new potatoes—I believe they were called "Beauty of Australia"—and he got 32cwts. of potatoes from 1cwt. of seed, and another grower got 3 tons from 2cwts. Change of seed is one of the great points.

Mr. JARRETT (Maitland): When I first started growing potatoes I planted just what I could get, and my experience from planting anything that came along was that I got all classes of potatoes. As they were dug the best plants were put aside and kept for seed purposes, and we found that we could grow as good potatoes from these as anyone else.

Mr. DALL: Our experience went to prove that we could keep potatoes a great deal better if we dug them a little early rather than a little late.

The GENERAL SECRETARY: You can destroy the caterpillars in potatoes by using bisulphide of carbon. A trench will do, provided it is covered with a tarpaulin.

A DELEGATE: What about onions.

Mr. RUWOLDT: Hundreds of tons of onions are kept stacked in bags at Mount Gambier.

Mr. BROCKLEHURST: We tried keeping them on wire shelves, but we found that method too expensive. We want to find a way by which we can keep our profits, and make the industry pay better than it does at the present time.

Mr. KILLMIER: In February we stowed away three different kinds of onions, and about a week ago they were taken out, and it was found that one quality had grown much, but another had not done so. I believe the Brown Spanish are not grown at all in our district.

Mr. RUWOLDT: If you send to a potato dealer at Mount Gambier for seed, you will probably get all sorts of potatoes mixed together. It is much better to send the orders to a potato-grower.

WEDNESDAY EVENING SESSION.

Farmers' Co-operative Loan Fund.

Mr. THOMAS (Johnsburg) read the following paper:—

For the sake of clearness I have divided the subject under different headings:—

1. The fund to be called the "The Farmers' Co-operative Loan Fund of South Australia."
2. The object of the fund is to provide cheap money for farmers.
3. The source of the fund shall be annual subscriptions paid by members. The suggested amount for annual subscriptions to be £1.
4. The fund to be under the control of a central committee, to be appointed by those agreeing to become subscribers to the fund. An accountant, whose duty it shall be to keep all the books of the fund, shall be appointed at such remuneration as is necessary; all other offices than this to be honorary.
5. It is desirable that Branch Bureaus shall be appointed district committees to safeguard the interests of the fund in their respective districts.

All applications for loans to be made through the district committees, and no loan to be granted without the recommendation of the committee of the district in which applicant resides. The committees to have power to recommend the loan in full or in part, or to reject altogether. No loan to be granted for a greater amount than two-thirds of the value of security. The committee to inspect all securities offered before any application be recommended. The applicant to state the object for which the loan is required. If the committee finds that the money is not so applied it may be called in. That a loan may be granted to the value of £50 to any one applicant on approved personal security. Personal security shall mean a written guarantee signed by two or more approved members. A reserve of £250 to be always on hand. No loans to be granted during the first year. All loans to be repaid in not more than ten yearly instalments; but, if preferred, may be paid off sooner. Interest and subscription to be added to yearly instalment. Loans to be granted to members at the lowest possible rate of interest covering working expenses. But loans may be granted to non-members at current rates of interest. All profits over and above working expenses to be carried to the reserve fund. It is desirable that all members of the Branch Bureaus be members of the fund.

All new members to be proposed in a Branch committee meeting and approved by a two-thirds majority of the whole committee—(this may seem rather hard, but it is necessary that the fund should be protected from undesirable persons). All persons to be members of the fund for not less than twelve months before they are entitled to a loan. Primary producers only to be members of the fund.

A fund worked on these lines will be of great advantage to farmers, because by co-operating to build up a fund, loans may be granted on very easy terms and at a low rate of interest, and farmers requiring help would be rendered independent of the Government or private banks The more members we get the stronger the fund will become, and the more helpful it will be to all concerned. As time went on and the fund grew, its operations could be extended to assist the members in other ways than lending money—such as experimenting with new machinery and fertilisers, or the purchase (for the mutual advantage of the members) of new breeds of stock, poultry, &c., or in any other approved way. At the Congress considerable mention was made of the "People's Bank" on the continent. I have read the matter up, and I find that the conditions of the people in Europe and out here are altogether different, so that schemes which could be worked to advantage there would fail here. I have, however, adopted some ideas from those "Banks" which I thought would be helpful to us; but the system as a whole I do not think could be successfully worked here. I feel confident that some scheme of this kind could be established in our colony if all would pull together and give the thing a fair start. This would not be a relief fund in any sense of the term, but would be simply self-help. The southern farmers would be able to get as much help from it as our northern men, and if all took the matter up heartily a very strong fund would be built up, quite capable of meeting the needs of all concerned.

Mr. G. H. DUNN (Johnsburg): In the past there has been some misconception as to the views of our Branch. We do not advocate a relief fund or a charitable institution. Our idea has been to establish a fund from which farmers may get loans—something that will come in between the ordinary relief fund and present financial institutions—so that people who require assistance may get it at a low rate of interest.

Mr. J. von BERTOUCH: I desire to have a chance of bringing forward the Permanent Farmers' Relief Fund again. Twelve months ago I was called on to give an inkling of my scheme, and the Central Bureau wrote to me about it. The scheme appeared partly in the pamphlet which was circulated amongst members, but I find that it has been misunderstood in many ways, and, if the Chairman will allow me, I will read it to the Congress—

[Mr. J. von Bertouch's idea was to create a mutual benefit society among agriculturists, and not to appeal specially to residents in districts where, as a rule, ample rain falls and regular harvests can be relied upon. He suggested a Central Trust Committee in Adelaide, with Branch Trust Committees in various districts. Members to be "any persons who subscribe to the funds under trust either in cash, goods, or kind." He would have the Central Bureau of Agriculture and its Branches assist in the establishment and administration of the trust; also the Travelling Inspector of Farmers' Unions. In fair seasons farmers to be asked to enlist as members by contributing one bag of wheat from each hundred harvested. Central Trust to hold the funds, and distribute as required by Branch Trusts in times of distress amongst members only, upon recommendation from Branch Trust Committees. No cash to be granted; but only necessaries of living, horse feed, and seed wheat. Such articles as flour, tea, sugar, meat, &c., to be regarded as gifts, but horse feed and seed wheat to be repayable in value with the return of fair or good seasons; repayment secured by bill of sale. Central Trust to keep books of account, recording amount subscribed and proportions redistributed in each district, the proportion subscribed by any district not to be used for another district without special consent of the Branch Trust Committee for that district. Not more than £5 to be held in hand by any Branch Trust or Secretary at any time. All moneys received to be remitted at once through a bank to Central Trust bank, and Central Trust to be advised. All goods received to be at once converted into cash. Books, &c., to be open to inspection by subscribers. Annual balance-sheet to be published. If funds become exhausted no member to be entitled to any claim whatever.]

The GENERAL SECRETARY: This paper of Mr. Thomas' is very much on the lines of the Peoples' Bank, in Germany; and, thinking that members might be interested in them, I asked Mr. F. H. Snow, who has already written a paper on the subject for the *Journal of Agriculture*, to be here to-night. He promised to come, but he had to go to Melbourne, and he asked me to postpone the discussion. I could not do that, and it is to be regretted that he could not be here so as to tell us how the German People's Banks could be applied to the circumstances of our farming population.

The CHAIRMAN: This is rather a difficult question. I should think that Mr. Thomas has read what was in the appendix to the report of the State Bank Commission five or six years ago, before I left Parliament. I then translated from several books I got from Germany such portions as I thought would be of interest to the Commission. If Mr. Thomas has read them, I can understand him thinking that the German Banks would not do for South Australia. We are, to some extent, a shifting population, and not, as in

Germany, where families live in the some district for generations. Here our population shifts so much that it would be difficult for one farmer to get another to be security for him. Mr. Thomas wishes no one to be allowed to join unless he is a person to be trusted, but I am afraid that would make bad blood in a neighborhood if a man was refused. Still, at the same time, Mr. Thomas has outlined a scheme well worth thinking over. I should like him to say something more about this question of selection.

Mr. J. McColl (Richman's Creek): This question requires very great consideration. At the same time, unless we safeguard the entrance to the fund, a great many may become members who are not good enough. I think the local committees are the best able to judge whether a man is likely to be a satisfactory member, and they could make a recommendation to the Central Committee. Our Branch is in favor of loans to members at low rates of interest to help them to tide over a bad time. Farmers are no worse than other classes, but there are, I know, many who would take advantage of such a fund if it was not safeguarded. It might prove an advantage to many who are honest and straightforward, and who would do all they could to repay a loan, though I admit there are numbers who, when they get a harvest, spend all they get, and not always wisely. Reference has been made to the shifting nature of our population. In the outside districts there are many who will have to move, and this fund could not help them, but it may be a benefit to those who stay. I think farmers who get any returns would willingly subscribe, even if they had no intention of taking anything out of the fund.

The Chairman: I do not think the question has been sufficiently considered yet. The best plan would be to refer it to the Branches.

Mr. D. Wake (Elbow Hill): Our Branch is in favor of such a scheme as this, and we appointed a committee to draw up a plan; but it was not done, and we eventually decided to await the publication of another article by Mr. Snow, so that we could take it as a guide. I feel that we should have an agricultural bank, or something of the kind. A relief fund would really mean that the poor would have to help the poor, and a better thing would be for the Government to provide land for closer settlement for those who cannot live in the north.

Mr. T. Price, M.P.: The Chairman suggests sending the question to the Branches for consideration. Perhaps this would be best; but why not discuss it here first? We are all agreed, I believe, that co-operation is a good thing. Certain it is that co-operation has so far only proved a success for distribution purposes. As touching production, it has been a struggle because we do not trust each other, and are not satisfied with the division of profits. The question is—cannot all make some slight sacrifice for others? Most successful movements in co-operation have been begun by the accumulation of a little. The most important in the world started at Rochdale, where a number of people gathered together and agreed to pay 2d. a week to help each other. That movement has grown to millions a year.

A Delegate: Over £41,000,000.

Mr. Price: The People's Banks in Germany, and on the Continent of Europe, generally could not be applied here. From my own personal knowledge and investigation of money-lending in Adelaide, outrageous interest is often charged—from 10 per cent. up to 35 per cent. and over. And the great majority of those who fall into the nets of the usurers in South Australia are people who work on the soil. (Hear, hear). A series of articles has been written on the subject in one paper, and, as far as the writer can find out from the books of the money-lenders, the greater number of borrowers are people who have pledged a horse or a cart, or some farm implements, for a little accomodation at a time of need. The fact that we have been a shifting population does not touch the question, because we are getting more permanent every day, and

I believe in future whole families will settle in certain districts, as in Europe. With that increased permanency we are getting better acquainted with each other, and consequently more confident in our neighbors and more willing to overlook their deficiencies. Small subscriptions could be paid by each member of circles, which could be formed by the Branch Bureaus, and a committee could be appointed to work the whole thing To-day it will be generally found that the smaller the loan the greater the honesty in repaying it.

A **Delegate**: There is no doubt about that.

Mr. **Price**: And it will always be so. I think a deal of good in the way of self-help can be done by this movement.

The **General Secretary**: Mr. Snow's article will appear as soon as he has time to write it. This movement advocated by Mr. Thomas has already been put into practice by one of our Branches. They did not wait for the Central Bureau to work for them—they started on their own hook. That is what I want done now. (Cheers.) This Branch has started a co-operative help society, with a subscription of 1s. a week. It is not confined to members of the Bureau, as the membership is about forty or fifty, although it has only been started about five or six weeks. You will see an account of it in the *Journal*. They have a cow club and also a loan club, and they hope to raise about £100 so that they can lend it at a very low rate of interest. Some time ago I got into trouble, and almost led to the dissolution of a Branch, because I told the members that the Central Bureau would not undertake the formation of anything of this kind. I did so because I knew that directly we commenced to be agents for an organisation like a Farmers' Land Bank we should bring ourselves into collision with others, and we do not want to do that on any account. Our work is to forward the practical interests of the people, and directly we go into agency business we shall find ourselves in opposition to vested interests, and that would be as undesirable as meddling in politics. It would be a very great mistake for the Central Bureau to act as a committee for loans, &c.

A **Delegate**: What is a cow club?

The **General Secretary**: It is a simple affair. As soon as they have got £6 or £8 they have a draw, and the man who is successful has a cow bought for him by the committee, and he pays off the cost by instalments.

A **Delegate**: It is like the Starr-Bowkett Societies.

The **General Secretary**: Something like them.

Mr. J. **Stott** (Brinkworth): I think the writer of the paper does not go far enough. I do not think it should be confined to members, but made universal. Loans ought to be fully covered by securities, because if you go in for granting big loans on northern farms you will ruin the whole system.

Mr. D. **Fraser** (Inkerman): We have a grand institution now in the State Bank, and I do not see that we can improve on that. The man who cannot get a loan from that institution would be a very risky person to lend to.

Mr. C. **Ricks** (Cherry Gardens): You should get the rules of the Mylor Club. A finer and more hard-working lot of men you cannot find, and some of them had sense enough to leave 1,000 acres in the North to take up twenty acres of rough land in the hills. One delegate said the State Bank would do all that is necessary, but there may be good men without a penny of their own, and yet they have a right to live. I think a loan should be given to a man if he is trustworthy and of good character, even if he cannot give security. Why should I refuse to help my fellow man because he has not got a parchment representing a piece of earth? I think the Mylor plan would suit the farmers admirably if it is widened to suit the circumstances.

Mr. W. G. F. **Plummer** (Bowhill): I know of cases in our district where farmers have had bad seasons after spending all their money on clearing scrub, etc., and because they could not pay the storekeeper they have been sold up. The relief fund has been a great help to them to enable them to live. Even if they were able to get land from the Government, they have no means to work it and no security on which to float a loan. I think no security should be required, but loans should be granted on the recommendation of neighbors as to their character. I think some of the best points of both schemes submitted should be amalgamated.

Mr. J. Smith (Hawker): We have a very strong body of producers in the Farmers' Union. (Cheers.) If we do not split up too much I should think we could get a bank in connection with that. Some people talk about abandoning the northern country, but if you do that you are going to capsize the colony. We are going to stick there as long as we can, and it is going to go ahead again, too. (Cheers.) About 1893 lots of farmers went from the South to the North to look for land, and I believe we shall see them doing it again before long.

Mr. A. Hannemann (Arden Vale): I am sure we cannot come to a decision on this wide question to-night. I am afraid that, though Mr. Thomas' plan is better than the Permanent Relief Fund, the farmers up our way would not be in favor of it. If we start a fund we shall have to work it on sound business lines, or it will be a failure. There are, in every district, people who are in distress and could not subscribe, although they will want assistance. I agree with Mr. Molineux that, officially, the Bureau had better not have anything to do with the matter. It would certainly mean wrecking the institution. Up our way, three years ago, we formed a Farmers' Club, and, as soon as times are good and we are strong enough, we intend, amongst ourselves, to help ourselves in the first place by buying all we want on our farms wholesale. We have not been able to do anything so far, because we are in debt to the storekeepers, but as soon as we can get square again we mean to try it. We are pretty sure that we can save in that way from 15 to 20 per cent. on our purchases.

Mr. H. H. Whittle (Port Broughton): When the first Seed Wheat Fund was started I suggested that every farmer who had a fair crop should give a bag of wheat to it, to be repaid, of course, to the fund by those who were relieved. This would have formed the nucleus of a permanent fund. If farmers require protection they can get it by joining the Farmers' Union. It is one of the best institutions in South Australia. (Cheers.) Every load of wheat we sell to the Farmers' Union gives us a dividend.

The Chairman: The recommendation as to each farmer giving a bag of wheat cannot be carried out. The Distressed Farmers' Fund Committee had several bags offered, and all we could say was, "Sell the wheat and send the cash." It will be best for someone to propose to submit this subject to the Branches for consideration.

Mr. Whittle: What I meant was that each farmer should send the price of the bag of wheat.

Mr. C. E. Jorgensen: I move that this meeting is not in favor of Mr. Thomas' plan. Farmers can join the Farmers' Union or go to the State Bank.

Mr. Hannaford (Riverton): I second that.

Mr. Dunn: I propose that the question be referred to the Branches for their consideration before the next Congress.

A Delegate: I second the amendment.

The amendment was carried.

The General Secretary: I think it would be an advantage to make this a producers' question. I suggest that the word "Producers'" be substituted for "Farmers'" in the heading of the paper.

Mr. Thomas: I shall be happy to agree with that suggestion.

Co-operation.

Mr. E. J. **Harris** (Millicent) read the following paper by Mr. R. Campbell (Millicent):—

The question of co-operation has been dealt with at Branch meetings, conferences, and congresses of the Bureau many times, but as yet with little practical effect. There are certainly many cheese and butter factories carried on under the name of co-operation, but which are only joint stock companies in which supplying and non-supplying shareholders disagree as to how the profits shall be divided. A few cheese factories were started before the question was advocated by the Bureau branches, but there was no co-operative butter factory in existence until their establishment was vigorously advocated by the Central Bureau, but their general success should have instigated farmers to combine to further their own interests in many ways. There would be certainly many difficulties to contend against, probably the two greatest being the general lack of cohesion amongst farmers themselves and opposition of "vested interests." Why farmers should not unite in one body to market their own produce and to procure many of their own requirements passes understanding. The "Farmers' Union" now exists, and to show how blind farmers are to their own interests is only to state that comparatively few know anything about it, and fewer still are members of it. Yet it has often been publicly announced that members have received great advantages from joining the same. The Union works in the interests of its shareholders, and though not, in the writer's opinion the best system, has much in its favor, and could be used to promote the latter without unfairness to it. Whatever the lines decided upon, upon which a farmer's or producer's co-operation should be run, it must certainly have a city depôt or agency. The writer's opinion is that a local body in each district, acting on its own behalf, and doing its business through a city agency would bring farmers more into the necessary feeling of responsibility conducive to the successful working of such a business. Unless those interested can be made to feel it is their own institution the movement would not be successful. Many look upon the Farmers' Union as if it were only another buying agency, such as the private concerns they have so long done business with, and consequently are hindered from joining it. Until farmers realise that it is not the trafficers in produce that really make its market value, they will be the losers. The wheat-grower, the stock-raiser, the potato-producer, and the dairyman ought to be able to get very near to the consumer without the intervention of more than one agent. Many farmers think they (the farmers) ought to have a co-operative store, but if they have so far failed to market their produce to advantage by co-operation, what is the use of their going into a business they know nothing at all about, and would have to depend entirely upon paid oversight and management. At present a number of agencies of different kinds are run in each locality. Stock and station salesmen vie with each other and run opposition sales of stock, often with the result that one or two buyers attend each and agree not to run each other, even sitting together while the sale is proceeding. Potato-growers at present consign direct, sell to dealers, or get agents to place their stocks. Buyers frequently combine to bring down prices, and so the game goes on and "the monkey gets the cheese." The country is at present infested with travelling skin buyers of every line and kind, who buy up odd skins here and there, and often pay for them with "brummagem" jewellery or "shoddy" material, the vendors consoling themselves that they got more for these skins than "So-and-so gave for the last," forgetting that these buyers again dispose of the articles at a higher price, where they also could place them. Through a local farmers' agency this and other lines could be disposed of, even to their exportation to London or Continental markets, where they now eventually reach with two or three profits made mid-way. The writer has had satisfactory experience in shipping rabbitskins to London. It may not be generally known that hides, skins, &c., sold through city salesmen are subjected to a charge to the buyer as well as the seller. One need not think twice to find out whose pocket this comes out of. A co-operation serving the interests of its members would not have to descend to such practices. At present fat stock are dealt with by salesmen who have their "own customers to look after" *(sic)*, and it is a well-known fact that salesmen are often the buyers themselves, and it is against what is called "human nature" to pay too high a price if one is selling to himself, even though "the other fellow" suffers. Fertilisers are now a largely-used article, and could, through a farmers' agency, be bought in such parcels that could not be touched by the largest individual importers at present. The whole parcel could be bought under a guaranteed analysis, and could be dispatched to the several districts in which they were to be used in such quantities that special rates for freight could be arranged, and charges for handling would be reduced to a minimum.

A suggestion worth consideration is this:—Every district should have its farmers' agency under some such rules as the Adelaide Co-operation Society, and be worked by a local committee of management with a city agency for all branches, which would pay in proportion to services rendered, and if the members showed the same enthusiasm as they often do in their local race meetings, or other gatherings, success would be ensured, and their own advancement and prosperity attained.

Mr. H. B. Hacket also read a short paper on "Co-operation," pointing out the necessity for the producers and consumers taking into serious consideration the question of co-operation, and the benefits that would accrue to both from the producer dealing direct with the consumer. Generally the services of the middleman could be dispensed with. There was altogether too much difference between the price the producer receives and what the consumer pays. Take two instances: A farmer sells his wheat for 2s. 6d. per bushel, and a little later on buys flour from the same person at a price equivalent to double what he got for his wheat; the dairyman sells his butter at 10d. and the consumer pays 1s., and often more. Under co-operation the producer would get more and the consumer pay less. Co-operative societies could also purchase supplies in bulk, also machinery, and supply the same to their members at greatly reduced prices. In dairy machinery in particular the price charged for various articles is extortionate. We have two well-established co-operative associations in the colony, viz., the South Australian Farmers' Co-operative Union and the Adelaide Co-operative Society, the operations of which could possibly be extended to meet all requirements. I do not propose any definite scheme, as it is a matter for those directly interested to deal with; but I believe that it is only owing to a certain amount of jealousy and fear of one another that the producers have not ere this taken the matter into their own hands. A little thought will remove this; but the difficuity is to get those interested to give it serious thought.

Mr. Ricks: Farmers have been forced to think on the right lines by the hard times they have passed. There is no reason why, in a rich country like this, where we can grow everything we require, we should want a relief fund. It is the farmer's individualism that makes him helpless. Co-operation is what we want. To show why, I may mention that I am a market gardener. Last year I sold fine cauliflowers at 9d. a dozen. When I told this to a man from Port Pirie he would not believe me, because he said he had to pay 6d. each for them. By co-operation we can secure the results of our labor. A company on these lines is just being started now, and a large number of shares has been taken up. When a site was granted the Commissioner of Crown Lands made a stipulation that farmers should be allowed to come in, and we shall be glad to welcome them.

The Chairman: If any member of the Farmers' Union is present we shall be glad to hear him speak.

Mr. Thos. Mitchell (Chairman of Directors of the Farmers' Union): I thank you very much for the opportunity of saying a word or two, and I also thank the gentlemen who have read the papers here to-night. The Farmers' Union has been in existence about eleven years. We have something like sixty agents spread all over the country, from Hawker to Mount Gambier, and from the West Coast to Swan Reach on the Murray. If farmers are anxious to learn about co-operation, they have only to speak to one of these agents, or any shareholder, or to go to the head office in Adelaide. I am pleased that such an interest is being taken in this matter. The Farmers' Loan Fund appears to me to be very necessary, but we have the machinery for establishing it now if the farmers will only give us their support. Societies like ours, but older ones, such as those in New Zealand and other places, lend a lot of money. One class of farmers—those who have surplus money—deposit it in the society, and it is lent to those who need it. Of course this must be done on business principles if it is to be a success. It is no use talking about co-operation—we should take action. The old Farmers' Association—a political association I think it was—

had the matter often under consideration, but no action was taken. The Union started in a small way, and in the face of much opposition. Farmers are generally independent, and were suspicious about handing over their business to their neighbours. I am pleased to say, however, that to-day we have about 3,000 members. (Cheers.) We have not yet been able to make advances; but the time is not far distant when we shall do so. All we want is the capital. We do not ask you to pay in every year and get nothing back, but simply to take a few shares. We do not profess nor expect to please every one; but the directors are always pleased to receive hints, and we only want to make the Union the success it ought to be. (Cheers.) We have great opposition to contend with in vested interests. Something has been said about the producer dealing direct with the consumer, but there is a lot of difficulty in the way, and the profits are not so big as are imagined. I am sorry to say we were short of capital for some years and there was a loss, but we are recovering, and we hope soon to be in a position to pay dividends. The next best thing is that the Union has been able to give farmers more for their grain than they could get anywhere else, and that is as good as a dividend. I cannot give you details, as there is no time to-night. I want simply to show you where to get them. If you do, I think you will agree that joining the Union will be better than starting in opposition.

Mr. W. TILLER (Meningie): I think it would be a good thing to enlarge the scope of the Union so that it could take up the dairying industry, which is even more handicapped than farming. First of all dairymen were handicapped by the duty on separators; and, secondly, by the "sole agency" on those machines. I paid £32 for one and used it for fifteen months, and then found it too heavy to work. I had to get another, and I asked the merchants to allow me something on the old one. They refused, and I went to another firm and bought a machine for £24, which I now find is sold in England for £12 10s. or £13. There is no duty on it, and it is the "sole agency" which brings it up to that.

The GENERAL SECRETARY: I think Mr. Mitchell will be quite ready to admit I am the grandfather of the Farmers' Union (Mr. Mitchell—Hear, hear), and I am glad to see so many of my offspring about—(laughter)—but I am ashamed of them for not being better known. It is because of their modesty, I suppose; but if they will take a hint from an old dog who has travelled many a rough road, they can soon mend that. (Laughter.) Many of our members hardly know there is such an organisation

A DELEGATE: No?

The GENERAL SECRETARY: Still, I have heard many say they never heard of it, and more of them do not know its advantages. (Cheers.) As an old pressman and one who knows how to work the press—(laughter)—I advise them to give greater publicity to their work. As to the middleman getting too much out of your butter, I do not think the middleman gets such great profits as some people say, though in regard to some small items he does well. We have been paying from 5d. to 10d. each for cabbages lately, and to my knowledge they cost only 4d. a dozen. They came from Victoria, and they were entered at the customs as of the value of 4d. a dozen. There is something there between producer and consumer that co-operation will settle. (Hear, hear.)

The CHAIRMAN: If you want to bring producer and consumer together you must have depôts. It may not pay a man to go around selling pounds of his butter, but you can have depôts in town where the producer can sell direct to the consumer. That is how it is done in Germany. (Cheers.)

Mr. MITCHELL: Eleven years ago, when I was taking the first steps to form the Union at Jamestown, I applied to Mr. Molineux for information, and he very kindly assisted me by sending me a large amount of co-operative literature which he had collected from all the colonies. I have always been pleased to mention this fact and to say how much the Farmers' Union owes to him. (Cheers.) As to the dairying industry, some few months ago we had the question under discussion. We thought of opening a depôt for butter, and sent to 80 factories asking for support. I think five replied. We are willing to undertake any line in which we can see need of assistance and protection. If every farmer will take up ten shares, the Union will then be general through the colony and the whole difficulty will be disposed of. As to machinery, it must be remembered that there are local sole agents for nearly every line, and the Farmers' Union, if it supplied separators, would have to get a new make, and the question is whether it would suit our shareholders. There are so many diversities of opinion on these matters. Once we got a binder as a trial, and we could have supplied it for £34 or £35, instead of £70, which was the ruling price; but the public did not like it. Everyone found some fault with it, and, after being on our hands for several years, one of the directors had to take it. Then we tried supplying goods, and we bought a quantity wholesale. Our shareholders came and asked the price and then went to storekeepers and got their quotations. They said "Oh, we can get them for so and so from the Union." The consequence was that the storekeepers cut it a little finer than we did and our members bought from the storekeepers. If we go in for supplying, the shareholders must pledge their support and stick to it, or it will never be a success. (Cheers.)

THURSDAY MORNING SESSION.

The Standard Weight of a Bushel of Wheat.

The GENERAL SECRETARY read the following paper by Mr. A. GOODALL, Paskeville Branch:—

The standard weight of a bushel of wheat has been discussed by a great many Branches of the Agricultural Bureau, but nothing definite has been arrived at. My object in bringing this subject once more before this Congress is the hope that the matter will be fully discussed, and something practical done. At the present time the standard weight of a bushel of wheat, as fixed by the corn-trade section of the Chamber of Commerce, is of no benefit to the producer. In the first place the standard is fixed far too late in the season, as the bulk of the season's wheat is in the hands of the merchants before the standard is fixed. Most of the merchants of the present day adopt the practice of docking all wheat a halfpenny per bushel for every pound below the standard. Now, if we are to be docked for all wheat below the standard, we certainly should receive a higher price per bushel for all wheat going over the standard. "What is sauce for the goose should be sauce for the gander."

We are all well aware that South Australian wheat of late years has greatly deteriorated in the English and foreign markets. I noticed some time ago—I think it was the Hon. A. R. Addison in speaking on the wheat trade, stated that he had received a communication from a business man in England, who said that there was no doubt South Australia could boast of producing the best wheat in the world, and he went on to say, "And you can also boast of having the dirtiest in the world." I consider it a disgrace to have such a thing said about South Australia. How much better it would have been if the Hon. Mr. Addison's correspondent had been able to write that South Australia could boast of producing the best and cleanest wheat in the world. Now this is what we want to get at—to try to regain the reputation that South Australian wheat has lost; and I will try to show how this can be done.

At the present time we are losing from 2s. to 3s. per quarter on our wheat in the London market, which is a big item when wheat is at so low a price. The farmers are blamed for this state of affairs for not cleaning their wheat as well as it should be done. I maintain that the merchant is as much to blame as the farmer, for at present a good farmer who takes the trouble to clean, and is always desirous of producing a first-class sample, as a rule gets no more for it than the man who produces a sample only up to the standard. The majority of farmers would be only too glad to make their samples better if they could got a price in proportion. In my younger days I was always taught to clean wheat thoroughly. If twice through the winnower was not sufficient to make a good sample we had to put it through again. When I settled on the Peninsula I adopted the same method of working, but seeing my neighbors put their wheat only once roughly through the winnower, and bag up almost anything, and get the same price for it as I did for my wheat thoroughly cleaned, I very soon followed suit, for I found, under the circumstances, it did not pay me to clean my wheat above the standard, as it necessitated more labor, and what I took out by extra cleaning was only fit for feeding purposes, whereas by leaving this inferior stuff in I obtained market price for it. This is sufficient proof that the merchants are as much to blame as the farmers. If any inducement was offered to clean their wheat better, nearly every farmer would do so.

First we want a standard to work by; this standard to be fixed early in the season. I consider we have gentlemen in the corn trade section of the Chamber of Commerce who are quite capable of fixing a fair standard without waiting for samples from different districts. We all know if it is a good season the standard could be fixed fairly high; if it is a bad season—say a red-rusty one, for instance—the standard could be fixed low, for in a rusty season it is a more difficult matter to bring the sample up to 60lbs. to the bushel than in a good season to bring it up to, say, 64lbs. or 65lbs. If the corn trade section wanted any information in fixing the standard I feel sure the various Branches of the Agricultural Bureau would be glad to furnish it. When the standard is fixed the merchants should be asked to give market price for all wheat coming within 1lb. above or below same; but all wheat below that to be docked ½d. per bushel for each pound below the limited standard, and all wheat above to receive ½d. per bushel more for each pound above the standard. For instance, supposing the standard is fixed at 62lbs., all wheat going 61lbs., 62lbs., and 63lbs. be bought at market price, and all wheat below 61lbs. be docked, and all above 63lbs. receive a higher price. This would induce farmers to try to make their wheat above the standard, for wheat that will come up to the standard by being put once roughly through the winnower can very easily by careful cleaning a second time be made to go a couple of pounds over, and by my suggestion that would mean ½d. per bushel more, which would pay the farmer for his extra labor, and the merchant would not be losing anything by it, for no doubt he would also obtain a higher price for same.

The **General Secretary**: I think, in considering this paper, we should not forget that it is utterly impossible for the Corn Trade Sections to fix a standard for any one season before they get the samples to mix. They have no other means of knowing but this.

Mr. J. **Armstrong** (Robertstown): Is the high standard fixed for docking purposes? If the wheat we bring in is 1lb. below the standard we get docked a penny a bushel. Mr. Gleeson's paper in the July *Journal of Agriculture* gives a very practicable scale of charges. I think that paper should be adopted.

Mr. **McColl** (Richman's Creek): I quite endorse what the paper says about farmers laboring under a difficulty. They have no inducement to clean their wheat. I have put clean samples in the market and got just as much for them as others did for a very much inferior article. A great many farmers would clean their wheat if they could get a better price.

The **General Secretary**: Were the two wheats the same weight?

Mr. **McColl**: The weight is the same whether it is good or bad. If the standard is 63lbs., they will pay nothing extra for 65lbs. I think it is only fair that a higher price should be paid for wheat which goes over weight.

The **General Secretary**: How does the Farmers' Union do?

Mr. **McColl**: They have adopted a system of grading, and take first and second class wheats, but they cannot give an extra price for wheat which goes over the standard. It is often said that millers class their wheat and get a higher price for the best samples. Of course I know we have to depend on the English market, and therefore what we send should be in the best state possible.

Mr. **Badman**: It is well known by every farmer here that there are some wheatbuyers who take every possible advantage of the farmers.

The **General Secretary**: I am quite sure that the matter is not altogether fairly stated as between the farmer and the Chamber of Commerce. The Chamber of Commerce want to send to England a statement as to the quality of the wheat each season. In England they sell by weight and quality; but here we send home a sample of the average wheat, and it is sold on that. Nearly twelve months ago we asked the Chamber of Commerce to confer with the Central Bureau on this matter, and no reply was received. A few days ago I sent an invitation to the Chamber, asking one of the members to be present at the meeting this morning.

The CHAIRMAN: I suppose the reason they have not sent someone is because they thought they explained the matter sufficiently at a previous Congress. Perhaps they did. Cannot you help yourselves by becoming members of the Farmers' Union, and making it a point that extra quality shall be paid for? I believe the other buyers would then quickly follow suit.

Mr. T. GRAVESTOCKS (Riverton): Some twenty-two or twenty-three years ago some of our wheat got bleached a bit, and the buyers got at the farmers by knocking off 2d. or 3d. a bushel. Sixty pounds is a bushel of wheat, and it is the standard which should be adopted—anything over to be paid extra for. I always make it a point to thoroughly clean my wheat, and I took some which weighed 66lbs. to a miller in Riverton last year, and asked for a little extra. He said he could not make two prices. More flour can be made out of a bushel of wheat going 68lbs. than a bushel weighing only 62lbs. It is said that we get paid for the weight if it goes over the standard.

A DELEGATE: So you do, of course.

The GENERAL SECRETARY: Certainly you get paid for a bushel for every 60lbs.

Mr. J. DAVEY (Yorketown): Of course a farmer gets paid for every pound his wheat goes over 60lbs., but 64lb wheat is of more value to the miller than 60lb., because there is relatively more offal in the latter. The Chamber of Commerce, if they tried to fix the standard early in the season, might wire to England and say it would be 62lbs., and then find later they could have made it 64lbs., and we should lose correspondingly in the English market. The Chamber of Commerce must be very careful in this matter, because, if their standard cannot be depended on, buyers in England would lower their prices so as to allow a margin sufficient to cover possible defects. I know there are careless buyers who scarcely look at the wheat if it is scarce, but take anything. I remember many years ago bringing a load of fifteen bags from Angaston to Adelaide, and it got wet on the way. Although it was almost bursting out of the bags the first miller I met offered me 15s. a bushel for it. (Laughter.)

A DELEGATE: What was the standard then?

Mr. DAVEY: There was none. The Victorian Diggings took all our surplus and we exported nowhere else.

Mr. J. A. LEAHY (Caltowie): The question of grading wheat has been brought into great prominence during the past four or five years. The conditions in South Australia in that time have not been favorable to the production of first-class wheats. The buyers who have been complained of have to buy by the standard, but that has unfortunately been fixed too high for a very great part of the colony. In our district we claim that we all clean our wheat, but I do not think that it is part of a farmer's work to grade it. The complaint we make is that the reduction in price paid for wheat which does not come up to the standard is greater, in proportion, than the relative inferiority of the grain.

Mr. J. S. McLEAN (Gawler River): I think a good deal of the fault lies with the agents for the buyers. They rarely look at the wheat, and do not care to refuse it because that would mean losing their commission. If we sent a resolution to the buyers asking them to make the agents stick to the rule of testing the wheat farmers would be compelled to clean it thoroughly, and gradually the price would go up.

Mr. S. THOMAS (Amyton): I had two lots of wheat to sell. The larger part went 1lb. over the standard and the other 2lbs. under. I made an agreement before selling whereby I got full price for the lot because it averaged about the standard. A neighbor of mine took in some wheat which weighed 65lbs. and got standard price. Then later he took some a little below the standard, and was docked. I think some blame attaches to the Branch Bureau secretaries. The Secretary of the Chamber of Commerce asks them to send in average samples, and there is not one in five who does so.

A **Delegate**: Yes; they have to pay carriage.

The **General Secretary**: Is it not a fact that the Chamber of Commerce insists on the samples being only those of wheat sold at the standard fixed? The Chamber of Commerce demands a sample of wheat which comes up to that standard

Several **Delegates**: No.

A **Delegate**: They ask for a sample of what is sold without being docked.

Another **Delegate**: The average sample of what is being sold in the district without docking.

Mr. **Stott**: I want to point out a disadvantage some of the late districts labor under. The standard was not fixed till January or February this year. It was 62lbs. last year, and the early districts, such as Baroota, worked under that while the bulk of our wheat was not in until the standard was raised. Why not have a fixed standard instead of altering it each year?

The **General Secretary**: Because a sample has to be sent home every year as a guide to purchasers.

Mr. **Stott**: Well, fix it at 62lbs., and we will grow 62lb. wheat.

Mr. H. **Killmier** (Tatiara): I think there should be three standards—one for the North, one for the South, and one for the South-East. It is not fair to have the same for the whole of the colony. Many of the agents know nothing about wheat, and the first thing they do is to get some from the best farmers in the district. All that does not come up to that is docked.

Mr. **Stott**: We had a sample from Mount Barker sent to our district. It looked a lot better than our wheat, but it only went 65lbs. and ours went 66lbs. You cannot always judge the wheat by the appearance of the grain.

Mr. **Illman** (Dowlingville): Wheat at 62lbs. will make a very poor show in the markets of the world. Nearly all our wheat would go from 64lbs. to 68lbs. if it was properly cleaned. We are fast losing our reputation for wheat, and Victoria has topped us lately.

The Hon. A. R. **Addison**, M.L.C.: There seems to be some misapprehension as to why the Chamber of Commerce fixes the standard for our wheat. The principal reason is to prevent litigation at the other side of the world. If a standard is not fixed the English buyer could make it an excuse for rejecting whole cargoes if there had been a drop in the market. If the wheat is clean and up to the standard, they cannot refuse to take it I would like to point out also that the higher the standard is fixed, if it is a fair one, the better it is for South Australia. (Cheers.) The English buyers do not want our inferior wheat: they can get any amount of poor stuff. If we advertise that we have an inferior sample they will not buy, but if we have a good one they are always eager buyers. For the last few years our wheat has not taken the place it should do. If farmers will carry their memories back twenty years they will remember that South Australian wheat always fetched 3s. or 4s. a quarter over any other wheat in the world. (Cheers) The change is largely the fault of the buyers who have allowed farmers to deliver dirty wheat, not caring so long as they make a profit whether it fetches 60s. or 64s. a quarter in England. The best way to get over the difficulty, and regain our position, would be to appoint a man in each big centre to pass all the wheat sold there and give certificates as to its quality. They could then sell the wheat on the certificates. It would save time in the handling of wheat, and the man who passed the wheat would not care whether it went to Darling, Dunn, or Cave. Some gentleman here advocated mixing the wheats which are over and under the standard to make an average sample. If the Farmers' Union do that it will mean utter ruin, because if there is very much inferior wheat put into a cargo the English buyer will reject the lot, and that would be a nice position for the Union to be in. The Union has done good work in keeping up prices, but they should not attempt to ship inferior wheat. They must be just as particular as the merchants are to keep separate the good and the inferior wheat. The great thing in shipping all produce is to have a uniform sample that the buyer in the old world can depend on. One speaker said he only got the same price for 65lb. wheat as his neighbor did for 63lbs., but it was nothing of the sort, for he got paid for 2lbs. extra on each bushel. It is often a farmer's own fault if he does not get a better price for a specially good sample, because he cannot keep his business to himself. I handle my wheat myself, and do not employ an agent, so I can if I like pay extra for a good sample; but I have got into trouble often for doing so. I have heard of it again not half-an-hour afterwards, because the farmer tells all his acquaintances what he gets for his produce. This year I have paid 1d. a bushel extra for 65lbs. wheat, and it paid me to do it. The fact is you cannot make a good flour with 60lb. wheat. I trust the Bureau will resist any attempt to lower the standard. No one ever heard of a wheat getting a prize unless it was well on to 70lb. Farmers in the North do not half clean their wheat. I get more dirt out of my mill at Orroroo in a week than I used to do in a month at Middleton.

A **Delegate**: Perhaps you mill more wheat.

Mr. **Addison**: No; about the same quantity. (Cheers.)

Mr. **Wake**: Our branch is in favor of a 60lb. standard—over to be paid for, and under docked.

Mr. **Venning**: I propose—"That the standard weight be fixed yearly, as at present." One reason why prices have gone down is that we have gone in largely lately for flinty rust-resisting wheats, which do not suit the English market. The soft wheats are better for milling purposes. Clean your wheat thoroughly and keep the tailings for home consumption. I hope the question of which are the best wheats to grow will be well discussed by the branches.

Mr. **Badman**: I second the motion.

Mr. **Brown** (Port Elliot): I support the motion. If I have 68lb. wheat and the price is 5s. a bushel for standard quality. I get paid for 8lbs. extra on each bushel.

Mr. **Gravestocks**: The best plan would be to sell by sample.

A **Delegate**: Well, that is what we do.

Mr. **Gravestocks**: Most decidedly not. I move as an amendment—"That buyers should buy according to sample."

Mr. **Wake**: I second the amendment. The sample should be 60lb. to the bushel.

Mr. **Plummer**: I move as a further amendment—"That there should be two standards—one of 60lb., for which market price should be given; anything going over to be paid for, and anything under to be allowed for."

The **Chairman**: I hardly think that is an amendment. It is covered by the previous amendment.

Mr. **Ricks**: The Chamber of Commerce should have two grades, and pay accordingly.

The **Chairman**: If you carry Mr. Venning's motion, some one might move to add—"That anything above the standard should be paid for, and deductions allowed for anything under."

Mr. **Venning**: I will not accept that.

Mr. R. **Barr**, jun. (Pine Forest): I move as an amendment—"That the standard be fixed permanently at 64lbs.," or I will agree to make it 63lbs. if you like.

A **Delegate**: I second that motion. The finer the sample we can show the better it will be for us.

Mr. Gravestocks' amendment was lost. Mr. Barr's amendment was lost.

Mr. **McLean**: I move as a further amendment—"That the wheat shall be paid for as per standard, and that an amount shall be added if over and deducted if under standard."

Mr. J. **Correll** (Minlaton): I second the amendment.

The amendment was carried, and the motion as amended was adopted.

Selling Bags as Wheat.

Mr. J. **Armstrong** (Robertstown Branch), in initiating the discussion on this subject, said: The new system of buying your bags and selling them filled with wheat at gross weight was sprung upon the farmers last harvest. The system is one-sided and inequitable. A farmer requiring 300 bags pays £6 5s. for the same, and, at present price of wheat, receives ½d. per lb. The bags weigh say 3lbs., consequently he loses 3½d. per bag, or £4 7s. 6d. on the transaction. If the system was fair the wheatbuyers would give us the option of selling at a net price and returning the bags. Then 2d. per bag is docked if the bags are discolored or second-hand. This means that if we store our wheat we run every risk of being docked because the bags have got a little dirty. Practically the buyers say If you do not sell your wheat at once, or store with me, I will make you pay for it. Then again, there is the farmer who has got a barn, in which he could store his wheat loose, and bags good enough to carry it to the market if he could get a net price and receive his bags back. The present system, however, prevents him doing this. He must buy the bags and make a present of them to the wheatbuyer. For the merchants to say the system is adopted in the other colonies is no argument in support of its being adopted here if it is unjust. I have had conversations with many farmers, who complain bitterly of the new burden placed upon them by the merchant. As an act of courtesy the Chamber of Commerce, or whoever was responsible, should have given the Branches of the Bureau an opportunity of voicing the feeling of those interested on such an important matter. The members of the Bureau, as representatives of the farming community, are deserving of some recognition from the millers and others when matters affecting their interests are being dealt with. When this system was under consideration why could not the Bureau have been asked to appoint delegates to confer with the representatives of the buyers, so that the buyer and seller could work together and make a more satisfactory arrangement with regard to bags separate from wheat. I think a fair way would be for the buyer to supply the bags and charge, say, ½d. per bag for the loan of them. He would get 10 per cent. on the capital he has to lay out I see Mr. Dubois, of Elbow Hill Branch, speaks in favor of the wheatbuyer, and says often the only profit he gets is due to the increase in weight gained by the wheat on the voyage home. I think he is out of it there. Mr. Gleeson says that there is a profit of 4½d. a bushel made by the buyer. Every farmer knows that a bag does not weigh 4lbs. Last season the difference between the Robertstown price and the Port price was 6d. a bushel. Of that 2d. is accounted for cartage to Eudunda, so that really we get nothing for our bags.

A **Delegate**: I should like to hear what Mr. Addison has to say on this subject.

The Hon. A R. **Addison**: At present in every market in the world bags are sold as wheat. As to gaining in weight on the voyage, if you scraped out a ship clean at the other end you might get a greater bulk than when it was shipped, but you cannot sell the sweepings as wheat, and the rats always destroy a lot.

Mr. WAKE: I think if a farmer pays a half penny each for the loan of the bags the merchant should pay the rest. It is only the farmer's wheat till it gets to port, and the merchant should pay for the bags to ship it in. If wheat was 5s. a bushel it would be all right for the farmer, but now that the price is low the merchant gets the benefit.

Mr. JORGENSEN: I do not think we can alter it. I move that the present system be adhered to.

Mr. A. G. F. BAUER (Appila Yarrowie): I second that.

Mr. SMITH: There has been a good deal made out of this matter, but there is really nothing in it. We must put the wheat into bags, and we cannot expect the merchants to invest £30,000 or £40,000 in bags and give them to us. Whatever you do the price of the bags will have to come out of the price we get for our wheat, and we may as well face that fact. Under the old system 3lbs. were deducted for the weight of the bag, but we paid for them just the same. Some firms advertise their goods as "boxes free," but you can depend on it the boxes are paid for by the purchaser. (Hear, hear.)

The GENERAL SECRETARY: I would point out that if a merchant supplied you with bags you would either have to sell your wheat to him or pay him for them.

Mr. BROWN: I support the motion. Wheat may go up to 6s. again, and then we shall get the benefit. If we have the bags lent to us it will put us into the hands of the merchants, while if we buy our own bags we can store the wheat from year to year if we choose to wait for better prices. Even if we store with a merchant we can demand our wheat back if his price does not suit us. We could not do this if it was in his bags. (Hear, hear.)

The motion was carried.

THURSDAY EVENING SESSION.

Tree Planting in the Far North.

Mr. A. F. NOLL (Quorn) read the following paper:

This is a most important subject, and one which has been before the public very frequently of late, and all the advantages accruing therefrom were plainly pointed out, from its influence on the climate, its usefulness for shade and shelter for stock, the necessity of producing timber and firewood, to its beautifying the barren country. I will not attempt to introduce anything new, but my object is to encourage forest tree planting in the Far Northern districts, where it is generally said that it is no use as they will not grow. My own experience shows that such is not the case, as I have nearly 2,000 trees growing in an avenue of three rows along the road adjoining the park lands south of the Town of Quorn, over a mile long, and in places on both sides of the road. The trees are of various ages, from seven years down to one year old, and therefore also of various heights, from 20ft. downwards. The last five years have been very dry and the growth of the trees has been greatly checked. To those who have been unsuccessful in the past I would say, "Try again." There is scarcely any farm where a suitable spot could not be found to grow some trees successfully; low-lying ground, where the moisture will drain to, should be selected if possible. In our dry areas the ground should be well ploughed, 6in. deep will do, but if deeper so much better, and the ground well pulverised. Plant the young trees carefully, and take care of them the first year; if the soil gets too dry, a watering should be given, and the soil loosened around them, and kept free from weeds. If the young trees are assisted through the first summer, they will generally hold their own afterwards, provided that they are kept free from weeds, and securely fenced against stock.

I would advise intending planters to raise their own trees, as this can be done with very little trouble. The trees are then on the spot when wanted, are not damaged through carriage and exposure to the air, and can be planted when it is convenient and the weather is suitable. There is no doubt that the Sugar Gum is the best tree to plant for timber in the north; it is hardy, and a fairly free grower if the conditions are suitable. Where trees are required for shade I would recommend the Pepper tree. Seeds of both should be sown in boxes or pots in nice sandy soil in January or February, the seeds should only be lightly covered with fine sand, and kept moist till the plants are up, and regularly watered afterwards. If the plants come up too thick they should be thinned out; if in pots, it is best to leave only one, the strongest, pulling out all the others. The young plants should not be sheltered too much, or they will be too tender and will suffer from frost when planted out. I would not advise planting too early, the end of July and August is early enough, as there is then less danger of frosts.

The **Chairman**: What sorts of trees have you planted?

Mr. **Noll**: The greater part are sugar gums, and some pepper trees, tamarisks, mulberries, and a few olives.

The **General Secretary**: Do you find that frost affects the sugar gums?

Mr. **Noll**: It does if they are planted too early, or in unsheltered places.

Mr. M. **Eckert** (Arden Vale): I have been planting trees for a good many years. I am only eleven miles from Mr. Noll's place, and yet I never had any success with them. If I had not seen his place I should not have thought it was possible to make them grow. Tree planting is more difficult than wheat growing, and my experience was that the frosts killed them. A gentleman saw me planting trees in red loamy clay, and he said "They will not grow, because the soil holds water; as soon as a rain comes it will fill the hole and rot the roots." I believe there is something in that.

The **General Secretary**: Hear, hear.

Mr. **Eckert**: I may say, however, that my ground is much like Mr. Noll's.

The **General Secretary**: I have seen many trees planted on that red clay in the park lands in wide holes. When the summer comes the earth shrinks, and if the tree lives through the hot weather the water kills it in the winter. The late Conservator of Forests recommended that the land should be ploughed as deeply as possible.

Mr. **Badman**: Did Mr. Noll plough his land?

Mr. **Noll**: Part of it I subsoiled, but some I simply ploughed; but I did not dig any holes except just where the tree went in. As for frosts, I shelter my trees with broom bush.

Mr. **Badman**: I would like to ask Mr. Eckert if he ploughed his land?

Mr. **Eckert**: No.

Mr. **Badman**: That makes all the difference. Ploughed land drains the surface, and would have prevented the roots from rotting. I have planted a good many trees, but they are principally red gum, because sugar gum is not reliable timber, and is not nearly so useful as red gum. The latter grows remarkably well, and does well for posts and building sheds. This year, from each of several trees 23 years old, I have got three lengths of posts, a shed fork 11ft. or 12ft. long, and several other pieces of rafters.

The **General Secretary**: Is your land limestony?

Mr. **Badman**: Some of it.

The **General Secretary**: Do red gums grow on it?

Mr. **Badman**: Yes.

The **General Secretary**: They will not do so anywhere else.

The **Chairman**: Where is your place?

Mr. **Badman**: Three miles west of Tarlee.

Mr. **Aldenhoven**: I am sorry Mr. Noll did not mention carobs as shelter trees. I have planted them mostly for breakwinds. I raised them in tins, but they are difficult to plant out, as there is a long taproot and you must not break that. There were several breaks in the row where the trees did not grow, and when I dug down I found that the hole had not been taken down through the clay to the loam. In some places the greasy clay goes down 4ft., and that was where they missed. I also planted a lot of sugar gums six years ago, and they are now 25ft. high, although they have had no water since the first year. Redgums may do in Mr. Badman's district, but in the far north they never succeed except in watercourses. You can see them in the Flinders Ranges on the sides of the hills, but they are all stunted except where they are in the creeks or gullies. I have got good timber for rails, posts, &c., from young redgums, and I find that while they are young they are better for that purpose than sugargums.

Mr. **Brown**: I am rather surprised to hear young red gums recommended for posts. My experience is that they will only last two or three years. Blue gum or sugar gum are better, both young and old, because they are not as brittle.

Mr. **Badman**: Of course I always season the timber for twelve months before putting it into the ground. Otherwise you cannot expect it to be reliable.

The **Chairman**: If you want to keep your timber for any length of time it is important to cut it at the end of the summer, when there is no sap up. If you do that red gum will last almost for ever. I took up posts this year which were put in in 1849, and some of them are as sound as ever.

Mr. D. **Kirk** (Riverton): You cannot beat the carob for a shelter tree for cattle. I have some on red soil with a clay bottom, and others are doing well on limestone soil only a foot deep and with a solid rock bottom.

Mr. **Brown**: What sort of posts were those the Chairman spoke of?

The **Chairman**: Split posts.

Mr. **Brown**: That accounts for it. I have dug out stringybark trees which have been in the ground for fifty years, and they were not rotted.

Mr. T. **Casley** (Mount Remarkable): I find sugar gum the best. You can get 4 x 1½ rafters out of it, and you cannot say the same for red gum. Sugar gum is nasty stuff to handle, but you can make gates, doors, and almost anything out of it. At Mount Remarkable it seems to grow on rocks, where you would not think anything could live.

Mr. **Hannemann**: We have a very hot climate; and by going in for tree-planting on a wholesale scale we may modify it. This we are not likely to be able to do individually, but we have a very good Forestry Department, which is carried on at a very small expense, and which can help greatly. It is becoming very difficult to get timber for fencing, and we shall soon have to face the situation seriously. We have the machinery in the Forestry Department from which we can get trees, a privilege which is not availed of to any extent. The bureaus should take up the matter, and make Arbor Day of more importance in their districts. Money should be collected to establish depôts in the centres, so that it would not be necessary to order trees from the department. Farmers could often spare half a day to plant trees if they could get them handily, when they could not afford the time to go twenty miles for them. Then the district councils may do a good deal by planting out some on the roads and watercourses, and the railway lines could be planted, while there is a lot of leased land belonging to the Government which could be resumed and planted.

The **General Secretary**: Several of our branches have from time to time desired to appoint a man to raise trees for all who would undertake to plant them out. When the idea started I was able to get seed from the Conservator of Forests, but he has now refused to supply me with any more. I suppose I made too many demands on him. Seeds, however, are very cheap, and for 10s. you can get enough to keep a whole district going for a year. Another great advantage of the branches doing this work is that the trees raised locally are more likely to thrive than if they come from another district, and, besides, in sending them long distances they get damaged.

Mr. P. O. **Hutchison** (Port Elliot): I was surprised to see recently pepper and other trees growing very well at Broken Hill. I don't know if they were ever irrigated, but they certainly had not been watered for years.

The **General Secretary**: Petersburg is very dry, and sugar gums grow there without water after the first year.

Mr. **Brocklehurst** (Pyap): The tamarisk is one of the best drought-resisting trees we have; it is good for shade, and horses and cattle relish it as a fodder. I believe it would grow well in the North. It can be propagated from slips and makes a magnificent tree.

Mr. **Hardy**: Has any gentleman any experience in planting the tops of hills?

Mr. J. **Wilsden** (Appila-Yarrowie): I have planted sugar gums on hills and they thrived. I have also tried tamarisks, but I cannot get them to do.

Mr. **Hardy**: I think the hill tops in the North country should be planted in all directions, not only to beautify the landscape, but to make good use of the land. I would like to know if the Aleppo pine has been planted on the northern hills?

Mr. J. **MacLachlan**, M.P.: I have planted, not exactly on the tops of hills, but on high limestone ground. My idea was at first that trees should be planted in the hollows where the water will run down to them. I dug the holes 2ft. x 2ft. x 2½ft. deep, and out of an acre I got one solitary gum tree. Then I went to the limestone rise, a little distance away, and put in eleven acres. I just ploughed and harrowed it up and planted the trees, and they are from 14ft. to 40ft high. On the eleven acres I have something like 2,000 trees. I think sugar gums are the best. The Government, in my opinion, ought to give a bonus for tree planting, as, if there is anything South Australia wants, it is more trees. I strongly believe in the saying that "He that plants a tree is a benefactor to the race."

The **Chairman**: We had a bonus once, and Mr. Bradtke, of Mannanarie, got £130 in the shape of a land order. Very few others bothered about it, but Mr. Angas went in for tree planting and applied for the bonus. Then the people cried out against a rich man doing so, and the bonus was repealed. It was repealed by a majority of one in the Legislative Council, and the one was a member who did not know what subject he was voting on. (Loud laughter.) Germany pays a bonus for tree planting, and why should not we? (Cheers.)

The **Minister of Agriculture**: I am quite sure that if Mr. MacLachlan will move to re-instate the bonus the Government will give the matter favorable consideration, and do what they can to undo the mischief the Chairman has spoken of. This is an important matter, whether viewed from the point of beautifying our homes, finding shelter for stock, or renewing our supply of timber—which is rapidly being exhausted. There is a plantation which was formed by Mr. John Forbes, at Mallala, where there is not a red gum left, but the sugar gums are living yet. This shows that the latter are safer.

The **Chairman**: Mr. Bradtke's plantation consisted of sugar gums. He tried Pinus insignis year after year, but they would not grow.

Mr. **Hardy**: I think one reason why pines do not grow in the North is because they are not raised properly. People should raise their own trees, &c., especially pines. If you plant pine seed in boxes, and then put the trees into jam tins when they are about 3ins. above ground, you will not lose one tree in 100. Keep them fairly well watered and let them harden for two or three months. One reason why they sometimes fail if raised in pots is that the roots are allowed to run round the sides of the pots.

Mr. W. J. **Blacker**, M.P.: I think one reason why we have not been successful in tree-planting is that we have tried to accomplish too much. Trees must be looked after, and it is no use planting them and then leaving them to their fate. It is better to put in one tree and look after it well than to plant a lot and neglect them. The sugar gum is a good tree for South Australia. It is both ornamental and useful for timber.

The **General Secretary**: One point has been missed by the speakers, and that is the necessity for protecting trees from stock, which destroy thousands a year.

Mr. **Harkness** (Owen): If you want trees to do well you must cultivate the land between them.

Mr. **Noll**: I am very pleased at the discussion which has taken place. I have tried carobs, but not with much success, though I have a few growing. I tried tamarisks also, but they are no good for breakwinds as they give no shade in the winter. It would be a good idea to have tree depôts. Many trees are got from the Forest Department and planted out and left to live or die. The main secret is to plant them carefully, and look after them well until they are established. If there is no rain for a month after planting, the trees will die if not watered at this time of the year. I shelter and water them, and that is how I manage to get them to grow. Once they strike into the soil they will stand a lot of hardship.

Sheep and their Position on South Australian Farms.

Professor **Lowrie**: Mr. Chairman and gentlemen—I am to-night in a sense taking up an old sermon. This is a subject which I have had to discuss amongst farmers in different parts of the country—the importance of sheep on our South Australian farms. As far as I am concerned I have never felt called upon by reason of my official position to advocate anything in particular for the sake of saying something new. I have never given way to that feeling, and I do not think that the Agricultural Bureau can be accused of trying to justify its existence by advocating a multitude of things where there was no good purpose to be served. (Hear, hear). One of the very first matters I had to speak on after I came to South Australia was this very subject. In looking on South Australian farming with the inexperience of a newcomer, but, at the same time, with the advantage of parallel experience in another country and a different climate, it occurred to me that the first criticism that your farming in South Australia was likely to have levelled at it was the fact that there were relatively few sheep-proof fences and very little appreciation of the sheep amongst South Australian farmers. I do not think anyone going through the country would be struck more forcibly by anything than by your three-wire fences. Coming from a country like North Britain—where probably more sheep are carried to the acre on arable land than anywhere else, except in some parts of New Zealand—the fact was the more striking. It has been put on record that each 1,000 acres of arable land in Scotland carries 1,380 sheep. Of course, the pastoral country is excepted from that. It is not only in the quantity of sheep alone that Scotland excels, but also in the profits made out of them; and there is not a farmer there who does not realise that there is no stock which return anything like the same profit as sheep. Although we cannot hope to get the same profit as they do there, where prices are so much higher, I think relatively the profit to be made in South Australia is very much the same. I will tell you something that happened in 1872 on a Border farm in Scotland. There were 400 top lambs which sold at 46s. each, 400 seconds at 41s. 6d. each, and about 200 culls at 36s. The return from lambs alone there came to very nearly £2,000 off a farm of 1,100 acres, and those lambs were dropped in March and sold by auction in August and September at five to six months old. Of course, that was one of the very best years. I know for a fact that the shepherd, who was paid as Scotch shepherds are, with the keep of twenty sheep, besides which he was only allowed a few potatoes and other small things, realised over £70 from the fifteen ewes and five hoggets for their keep simply.

The **Minister of Agriculture**: How do the prices at the present day compare with the time you speak of?

Professor **Lowrie**: For the lambs which fetched 46s. they probably get about 32s. now. I have taken the example of one of the very best years (1872) because in pleading a case one never takes the worst illustration. (Laughter.) We, with a relatively small population, cannot expect to get anything like these prices locally; neither can we expect by the most skilful operations, and the application of the most advanced methods of freezing we may use in sending mutton to Europe, to get the same prices that farmers get there for live mutton, or as butchers get for fresh-killed meat. While we cannot do that, however, the case for cattle is a much worse one indeed. At the same markets that I have mentioned good bullocks will fetch from £20 to £32, while here the somewhat similar bullocks will only realise from £7 to £9; so I think the ratio is in favor of sheep. Our farmers who breed steers and heifers, and dispose of them at 1½ or 2 years old from 35s. to 50s., cannot do anything like as well as from sheep at all carefully managed. I feel, therefore, to put it colloquially, that I have got hold of the right end of the stick in advocating the keeping of sheep in the bulk of our South Australian country. I am not going to be invidious and to say that this class of stock should be cherished to the exclusion of others which, in certain districts, may be more profitable. I am not questioning the importance of dairying where the conditions justify it. I admit as readily as anyone, and I am glad to admit, that there is more money per acre and a more handsome cheque to be made at the end of the year out of it by a farmer who lives in a favored district and has the assistance of daughters and sons than there is out of keeping sheep. (Cheers.) But I am taking the case from the average conditions in South Australia, where we have a limited rainfall, and where we have to depend on dams—dams in which the quality of the water is very often of an unsatisfactory character. This water will not do for dairy cattle, but will suffice fairly well for sheep. The temperature during a great part of the year makes the conditions for the transport of dairy produce very difficult, and at the same time labor is relatively dear, and in this country to the north of Adelaide it will be found more profitable to pay our main attention to sheep than to devote it to dairying. I do not want to detract from the dairying enthusiasm; but I want to make the position as plain as I can, and to state it clearly, so that it may be better debated by those who think differently to me. I think that sheep are likely in our dry country north of Adelaide to be more remunerative than dairy cattle. Some gentlemen who are here I know breed another class of stock—pigs. During the past two or three years the man who had pigs was fortunate, and brood sows have been worth more than the average cows. A brood sow has been worth from £8 to £11 a year for her weaners; she will graze as well as a cow for six months in the year and not require one-tenth the attention. But if all the gentlemen in this room were to start pig-breeding between this and the new year, instead of getting from 11s. to 17s. for weaners we should be glad to take 3s. 6d. Pork has been sent home frozen, but it did not come out as successfully as the lamb trade. It may be that it will be found to pay when we find out the proper months to ship it, and we may then dispose of our surplus as we do lambs; but that has not been done yet, and therefore one is not able to argue in confidence in favor of the industry from that standpoint. For sheep I think I can. It is very satisfactory to see that the sheep on our farms are increasing, and that the number of farmers breeding sheep is rising rapidly year by year. The total increase in the number of sheep in South Australia is not so great as we might expect; but that arises from the fact that we have had severe seasons and some men have been stocking more lightly in consequence. The increase in the numbers of sheep therefore is not so great as is the increase in the attention paid to them. The sheep on the farm can be made of great assistance in keeping the place clean. I know you may buy store sheep and get a certain number of weeds with them, but the general tendency is for them to clean more weeds than they introduce or distribute. It is useful to have a few sheep to top off the oats on fallow if there is no time to scarify it, and then again with sheep you can feed down land in the spring that you are going to fallow next year much barer than with any other class of stock. Then again, relatively bare pasture will make the best wool; in fact, some of the finest wool in the world is made on rye straw and a little helping out with other things. Bare hard conditions do not affect wool as they would affect mutton. You can feed sheep on what would starve cattle, so long as you do not keep them too long on it; and that latter condition is important. Then very often a man may have wheat put in early in the season, which shows a tendency to become "proud," and he can feed it down with advantage if he has sheep. These are small matters, but they all help the case. Then there is the question of the butcher's bill, though I do not lay so much stress on that. I have never been able to agree with those who say that a farmer should grow everything he wants for his own house, as I think those who advocate it are a little beside the mark. If a man, for instance, can grow wheat more profitably than potatoes, let him sell his wheat and buy potatoes; and if he can grow lambs better than butter, let him sell his lambs and buy butter. There are districts better suited for one thing than another, and those who live in them should make the most of the most profitable industry. What one wants is to make the most money out of the land, and to do that he should use it for the purpose for which it is best adapted. If I can produce butter more profitably than mutton, then I am going to sell butter and buy mutton.

Now the question comes as to which breeds of sheep the farmer should go in for. I know that I am now touching very debatable ground, but it is ground which the most experienced sheep man in South Australia knows perhaps as little as I do. There have been so few breeds tried in South Australia, and they have been tried in so few districts—with the exception, perhaps, of the Lincoln and Merino—that I think no one is justified in being dogmatic on the subject. We can only reason by analogy, and we must hold ourselves open to any conviction that further experience puts in our way. I think that on a good many of our farms it will be found well to buy well grown draft Merino ewes off the shears from the stations, and use one of the Down, Shropshire, or Dorset Horn breeds as sires. A good many men may do very well in that way. Of course it is relatively few of the stations that have the class of sheep best for cross-breeding purposes. I mean the large-framed, heavy merino, with good loins and good shoulders. If a man could get within the next few weeks some good, large, well-grown ewes, thrown out for age and not for bad mouths, they will do for a start. Cull out about 30 per cent. of the inferior ones, and put them in the market to bring what they will. Young culls are generally inferior. Keep the others, and put them with a Southdown or Shropshire or Dorset Horn sire. Thus you will breed blocky, shapely, useful lambs. Have the lambs dropped at a season of the year when they will not get a check, because if they do they will get stunted and carry the effects throughout their life. Everyone, however, cannot secure the class of sheep I have mentioned. If all tried to do so it might force the market too much, and the high price would take away the profit. A better plan still would be to buy crossbred ewes when they can be had. Not only are they good nurses, but the crossbred sheep is in itself a profitable sheep all the world over. I was talking this matter to a gentleman last night, and I asked him something about the time when the first practice of cross-breeding was introduced on the borders of Scotland. He can remember it quite well, and he told me of a man who was believed to have found a deposit of gold buried in the old Border freebooting times because he got so suddenly rich. It came to his ears, and he said, " No, no ; I have found the crossbred ewe. That was a pot of gold to me." Since that time the crossbred ewe has grown so much into favor in Scotland that you will not find one farm in fifty on which it is not used. They are hardier than the average of the two breeds forming the cross. They are large, they are vigorous, generally good doers, and, though there is an objection that they are wild and creep fences, I think we should not make too much of that. If we say we cannot fence them we are simply arguing our own incapacity, and I should like those who complain of the Lincoln crossbreds to have to fence Cheviots. All that is needed is to pay a little extra attention to sheep-proofing. Crossbreds make better mothers I have said, and it is a biological fact that cross-breeding infuses greater vigor into the offspring. Therefore the crossbred dam is likely to pay us better on our farms than the pure-bred merino or ewe of the English breeds. It will certainly take some time before they will become so general as the merino. As things are, therefore, I do not think you can do better than to look about for the merino ewes I have described, and as time passes on I have no doubt the crossbred will be found most valuable here, and will be bred to meet the demand for half-bred ewes, as in Scotland.

The MINISTER OF AGRICULTURE: And in New Zealand ?

Professor LOWRIE: Yes ; and in New Zealand, too. You must beware, however, of crossing from both sides. There is no greater mistake. I could instance cases which would not appeal so forcibly to you as to people in Britain, where men have tried to make a distinct crossbred type. In the north of England and the south of Scotland the favorite breeding ewe is a cross from Cheviot ewes by Border Leicester rams. The ewe lambs are bought by the farmer, who expects to be able to buy his contingent of ewe lambs as regularly as he sells his draft ewes each year. He puts these half-bred ewes to Border Leicester rams, and gets a three-part bred lamb. The half-bred lambs are a bit small, and some farmers thought to breed from crossbreds on both sides as being bigger. If you went into an auction sale when some of the resulting lambs were being sold you would wonder what was happening among the buyers, when fine-looking, well-grown lambs were making even 3s. or so less than much smaller ones alongside ; but the explanation would be that the bigger ones were half bred on both sides. Some men stuck to it, and believed they could breed a half-bred sheep right out, and they went so far as to get a class put into a Highland society's show ; but there are very few practising it now, simply because they cannot sell the ewe lambs for breeding purposes so well. Avoid, therefore, I urge, the use of crossbred rams. Now as to the ram. It will pay you better to get a real good ram at the start than to take an inferior one at a quarter or one-fifth the price. I do not think, especially after what you saw in the show to-day, that you can readily get away from the position that the Shropshire sheep is likely to be found the best for crossbreds in South Australia—or at least one of the best—as it has been found to be in New Zealand, Britain, America, and elsewhere. It is difficult to get Shropshire rams, and the main point is to get them as good as possible. I would rather pay fifteen guineas for a well-bred Shropshire than I would give 15s. for one of the ragged so-called " Downs" which one sees now and again. I have seen them at country shows entered simply as " Down" sheep with no particular breed stated; and they were of no particular breed.

Mr. HARKNESS: Would you take the Shropshire for first cross?

Professor LOWRIE: Yes.

Mr. HARKNESS: On the merino?

Professor LOWRIE: Yes. I know there is much difference of opinion on the subject, and I know that both Mr. Alick Murray and Mr. G. S. Kempe recommended using the Lincoln-merino cross as ewes and the Shropshire as sire; and when a man like Mr. Murray, who has to-day won the ram and ewe championships, who has for years been taking leading prizes, and has very little to learn about sheep, says a thing we have got to pay due deference to his authority. At the same time, I think it will be found that the Shropshire on to a Shropshire cross, throwing a three-part bred lamb, will do as well or better. It will come earlier; it will be more shapely; it will be a better color in its markings; the percentage of losses will be very little greater, and the ewe will milk as well. I rather think that bringing in three breeds, as recommended by Mr. Murray, is probably mixing it too much, and the three-part bred Shropshire or Dorset Horn will be the better. But experience will teach us all in due time. Three-part bred lambs will certainly be more even than the product from the crossing of three different breeds.

A DELEGATE: What about the wool?

Professor LOWRIE: I had some valued to-day from a first-class Dorset Horn and merino, and it was valued at 8¼d. per pound. The sheep has been running amongst the killing sheep, and not cared for particularly in any way. It was shorn in the second week in November last and again this morning, and gave 8½lbs. of wool.

A DELEGATE: What age?

Professor LOWRIE: Two-tooth. Of course it is nothing great; but when you know that the live weight is 176lbs. I think you will agree that it is very well for sixteen months old. I find the Dorset Horns very satisfactory, especially for crossing for lamb-breeding, as I have got lambs at five months weighing live weight 127lbs., and with a very satisfactory class of wool. I think they will be found to compete well with the Shropshire. In breeding for the London market we are not so dependent on the black-faced sheep—they are of more importance for the local market. That breed of sheep is recognised in the south of England as one of the very best for lambs, and from which you can get lambs at any part of the season. If a man has got sheep let him by all means avoid overstocking. (Cheers.) That is a truism we all admit, but it is well to drive it home. Better have feed apparently going to waste in a good year than put more sheep on and find you cannot keep them next season. You will lose largely in lambs if you are unfortunately led to overstock. You lose it in the after-life of the sheep if the lambs are checked, because even if the next year is a good one they will not recover, and above all you lose right out a percentage of the sheep. It would pay you very much better to sacrifice 50 per cent. of them for less than they are worth than to starve the rest. Another suggestion is always to have one paddock laid down in permanent grass. It need not be very large, but a portion of the farm should be devoted to this purpose so that if it is saved in the spring and summer and the lambs are dropped in the last week of April or May before the early feed is ready you will have it ready for the ewes. Even if the feed is dry you will find they will milk fairly well on it, whereas on stubble and fallow the dry feed on that does not seem to have any strength in it. Then again, you will find that by doing so you will improve it greatly as pasture land, that at the end of twenty years it will carry two sheep where it formerly only supported one. I have known that to be so in many cases, so I think that suggestion is worth noting. It is always handy to be able to turn your sheep into this old grass paddock, and it may save you much. Another matter is not to try to do with too few rams, and still another is not to try to keep dairy cattle and sheep together because sheep will always starve cattle, although a few cattle are probably of use to get down the roughness of the land. If a man breeds his own sheep let him not be too sparing with his culling. It is like the old story of one greyhound breeder who was asked by another breeder what was the reason for his success, and he said, "By breeding many and hanging many." (Laughter.) So with sheep. If you are going to breed crossbreds by all means go up one step every few years. For the export trade, which I believe is going to go forward, the class of sheep we want is a blocky one—not able to look over a hurdle - level at the top, wide at the shoulders, deep in the bosom, full in the chest, wide in the loin, and well let down to the hock, and at the same time a well-covered sheep. Keep that in your eye, and do not spare a bit of money in realising that ideal. The poor sheep eats as much as the first-class animal, while the latter returns from 2lbs. to 2½lbs. of wool more and fetches 2s. more from the butcher. Therefore hurry up the culling process, and do not begrudge £10 or £15 for a good ram. I hope I have touched some points you may think it worth while to discuss, and that the result of the discussion will work out well for the sheep-breeding industry, which I believe is the one which can best be coupled with wheat-growing in South Australia. (Cheers.)

The MINISTER OF AGRICULTURE: The Professor's address has been most able and instructive, and I quite agree with him that the industry is going to be a very profitable one for South Australia. It is inexplicable to me why they should get so much better prices for home-grown lambs than we do for ours, because the difference in the quality does not account for it. Mr. Young tells me that the English public are eating our lambs and paying for them as home grown, and our best plan will be to try to make this fact known to the consumers. Perhaps they will then realise that the quality of our lamb is as high as that grown in Scotland. Every farmer should at least keep sheep for his own household. I can buy sheep for 8s. 6d. each and get 5s. 6d. for the skin, and as we use two sheep a week it pays me much better than giving the butcher 4d. a pound. As to breed we do not know yet for certain which are the most profitable, but the Lincoln-merino ewe put to a Shropshire ram throws a splendid lamb, and that cross, I believe, nearly always make the top price in the Adelaide market. We get most of them at the depôt for export. I know of a case where a plucky buyer who paid Mr. W. Ridgway, of Gawler River, 11s. each for them, sent them to London, netting 13s. 6d. each for them. The London correspondent of the *Register*, three or four months ago, said if we sent lambs over 40lbs. in weight they were sold as mutton at 3d. per pound. I ventured to dispute that and asked Mr. Young to find out; and he found that lambs of 45lbs. weight brought nearly as much per pound as 35lb. animals. Those who saw in the show the Dorset Horn wethers which were bred by Mr. Melrose must admit that they were splendid specimens. I think the quality of the wool on the Dorset Horn crossbred at the College is better than the Shropshire-merino cross. As to pigs, I think we should probably get a very fair price for good young pigs in the London market, but we must not expect anything phenomenal.

Mr. M. RANKINE (Strathalbyn): The subject Professor Lowrie has spoken on is a very important one, and there will not be time to-night to fully discuss the question of the relative value of breeds of the sheep. Personally I look with favor on the Shropshire, but I do not hold that the Shropshire ram will produce the best lamb; neither do I hold that the merino ewe is the best mother, as it does not milk as well as crossbreds. I have had a very long experience in breeding lambs for the Adelaide market, and were I beginning again I would go for a barefaced Southdown ram. They get a stumpy blocky lamb that takes the butchers' eye at once, and they are very early too. The Shropshire is a much larger sheep than the Southdown, and the lambs will take after the sire, especially if the sire is pure bred. Professor Lowrie has evidently kept his eyes open and has formed a very correct opinion indeed as to the requirements of farmers who keep sheep.

A DELEGATE: What is the best weight for lambs for the London market? There is a good deal of dispute about this.

Professor **Lowrie**: The Minister of Agriculture mentions 36lbs. to 40lbs., but I have told farmers that if they can get lambs to dress 35lbs. send them in if they are fat and it is the proper time of the year. You can sell them at less weight than that if they are fat lambs. Your question raises another, and that is, the best time to get them to London. It is said that lambs do not sell if they get to England about Christmas. Now, I cannot understand that, and I do not think anyone can. The very earliest lambs are the Dorset Horn or Hampshire, and they are the best under the most forced conditions possible. They practically used to be kept in the house all the time, and the ewes brought in to give them milk, so as to get a few ready for Christmas; so there ought to be a splendid demand for our lambs then.

The **Minister of Agriculture**: The ordinary people do not know they can get them.

Professor **Lowrie**: I expect that is the reason. They do not expect to get them at Christmas, because the price is so high. I think South-Eastern men have a grand chance, which they have probably not realised yet. In the North there is no chance of getting lambs home for April, but the South-East man can do it easily.

Mr. J. **Moody** (Orroroo): I should like to ask the Professor if he does not consider the merino the most profitable for the dry Northern Areas? The export trade may encourage the breeding of crossbreds, but it is not always possible for a farmer to avail himself of that trade. Having in view the increased price of wool, I should think the merino should pay well in the dry districts. I admit I have never tried crossbreds. Another point is that if you cross sheep, and there is a failure in the season and you get the lambs on your hands, they are most unprofitable stock.

Professor **Lowrie**: I thought I put that fairly clearly. We are bound to have the merino predominating, at any rate for a good many years to come. For the outside country there is no doubt that the merino is the best sheep, but for the intermediate country I hardly know what to think. The crossbred, however, seems to go through a drought just as well as a merino. Mr. Rankine is entitled to high honor for having kept pegging away at improving the breed of sheep when few farmers at least troubled about it. Years ago, when I saw his crossbreds, they were a splendid flock, and some of them would almost have sold as modern Shropshires.

Mr. W. J. **Blacker**, M.P.: For wheatgrowers in the dry places I admit that sheep-breeding is the best thing; but in the better districts dairying will go ahead. They can do then with smaller farms, and grow pigs, potatoes, fruit, and other things.

The **Chairman**: I should like to know if Professor Lowrie has heard of the new prolific sheep. The following extract came from the Agricultural Department at Washington:—"We have heard some little time ago of the large number of sheep throwing two and three lambs. Alex. Graham Bell, the inventor of the telephone, reported to the Academy of Washington in April that he had been successful in rearing a new race of sheep on his farm in Nova Scotia. In 1890 50 per cent. of his does had two lambs, and 33 per cent. of these ewes had rudimentary teats, while only 22 per cent. of others with one lamb had them. Within ten years he has by selection reared ewes with more than two teats that gave milk. In 1899 forty-one lambs had more than two milk-giving teats, viz., one with three, twenty-six with four, six with five, and eight with six teats. In the Cevennes sheep with more milk-giving teats have been reared for many years, their milk being used for making the Roquefort cheese."

Professor **Lowrie**: I never heard of them. We are not wanting twin lambs here—(hear, hear)—but we shall get a high percentage if we can manage to have the ewes, just before they go the ram, improving in condition as the result of a change to better feed.

FRIDAY EVENING SESSION.

Hindrances to Successful Farming.

Mr. DALL read the following paper:—

That there are successful and non-successful farmers is patent to everyone who has given any thought to the matter, and that in the same district, and very often where placed under similar circumstances. This has been the subject of inquiry by a great many, and the question is often asked, "How is it that farmer No. 1 seems to do fairly well, and has things comfortable around him, while farmers Nos. 2 and 3 seem to drag along, and everything points to the want of comfort, convenience, and prosperity?" The answers to this inquiry are varied. One says No. 1 had a good start and had capital to begin with; No. 2 is not so steady as he should be; and No. 3 is not a man who perseveres, and does not like work; and so each case is accounted for so far. But these are not the cases we wish to deal with on this occasion, as the man of capital is the exception, and the unsteady man, as well as the careless or lazy man are not at all likely to make their way where diligent application is so needful. But we want to find out how it is that one man without capital, and no better chance than the other, succeeds while others, with equal advantages and surroundings, fail year after year, till non-success weakens their chances and discourages the earnest toilers till there is little heart left to try.

The hindrances we wish to deal with are those that we see overcome by farmers of very small means, and yet that hinder and prevent so many from getting on as they wish and even strive to do, for I am well assured that there are those who work long and hard, and yet do not succeed. What, then, are the hindrances? Want of capital is not the main hindrance, as so many succeed without it. Want of capital often makes progress slower, but seldom prevents it if other things are equal. It is not want of diligent toil, for our farmers work hard as a rule. After long experience, careful thought, and observation, I put want of method among the main hindrances to successful farming. So many work without a programme, and, while always doing something, never work for a given object, hence seed time comes and there is little or no land ready for the seed; the result is that each month's work comes before he is ready for it, and often the working strength of the farm has already been used up when it is most needed. Thus we see on many farms very little fallow, and what little there is done is too late, and then not worked, as the ploughing was being done when the harrows and the scarifier should be at work. In this way a work that has assured success year after year with others is left undone, or done badly. I speak of fallow as it is one of the works that is preparatory, and, if done in a methodical way, helps all the other work through the season. Indeed, to quote an old farmer's saying, "It gives you the leading horse by the forelock" as far as all other work is concerned. The methodical farmer will try to decide what are likely sources of income, and will move in that direction, trying to provide for his household and the market in the best way, and at the best time.

Another hindrance is the want of suitable land in suitable quantities. I do not think the farmer is tied up to one kind of land in order to succeed, but I do think the quantity and the mode of working are very important, as I have noticed that while small holdings are all right in good country, with good rainfall, they are a frequent cause of failure in dry districts. Unless a farmer has from 800 to 1,000 acres in dry country he will find he has a hindrance that will be serious after a few years, and will be a certain bar to his success. Then there is the poor land, so often taken up by small farmers, which can never be made to pay, farm how you will, as it has no productive power, nor will it keep sheep or cattle alive. This is a hindrance that cannot be overcome, and the sooner a farmer parts company with such land the better. I am quite with the old farmer who says "Better rent good land at a fairly high rate than buy poor land that is spoken of as cheap."

Another hindrance is the want of feed for horses and stock, and is one for which many often suffer great loss. It is false economy to put everything into the wheat bag, though often done to try and make the year's income a little better, but in the end the farm proves less productive through not being able to work the teams at the time when work can be done to best advantage, besides doing injury to the stock through want of proper food.

Want of water is another very serious hindrance, and causes much loss of time and stock, and is one of the things that prevents the success of a great many farmers. Indeed, the time spent in one season in water-carting would have made provision for conserving sufficient water for the use of the farm In some cases this work of water carting has been repeated year after year, and the loss suffered over and over again.

Again success is often prevented by trying to take too much out of the land at one time without fallow, rest, or manure. The result is labour lost at seed time and crop sometimes returning even less than was sown as seed. Of course there are times when the best conducted farms fail to give a fair return, but it is and should be quite the exception, and not the rule, Sowing at the wrong time is a hindrance that has often been experienced, and in speaking on this matter I know it is often difficult to know when to sow to be right. The seasons vary so much that we can have no set rule; but extremes should be avoided as much as possible; too early sowing has often been disappointing, while the late is almost sure to be so. I think the condition of the land and the weather is the safest guide in this matter. Bad seed is another cause of failure, and has hindered many a farmer from getting as good returns as he should have. This is a hindrance that Australian farmers have not yet realised, and the sooner we wake up to the importance of this consideration the better.

But some one asks, "What do you call bad seed?" I would answer, "Anything diseased with smut, dirty, broken, and not acclimatised, not suited to the district in which it is sown, liable to suffer at harvest time through extra weakness of straw or looseness of chaff," as in some of these wheats the risk is too great.

Want of harrowing is one of the hindrances that is often shown in a very marked way, and many have had to suffer loss through this work being left undone. A mean substitute for the harrow is sometimes seen in a piece of wood drawn crossways behind the plough, leaving the ground unbroken and the seed not covered. Our motto should be—"Harrow well."

There are also hindrances, over which we have no control, in the elements and various other causes, but these are not the hindrances under consideration at present.

But there is one hindrance in the business matter of the farm that has made all the others more keenly felt; that is the fashion of always living a year ahead of the income. I have sometimes thought that this has been the cause of as many failures as all the others put together, but this is being remedied every year. I believe and hope the time is coming when we shall see a decided improvement in these matters, the effect of which will be the building up of a more independent and substantial yeomanry.

The CHAIRMAN: I should like to refer to the last paragraph, about the evil of living ahead of your income. In 1848 no credit was given—you had to pay cash for everything. I took a lot of stores up with me to the Bugle Ranges, but we ran out of tea. I sent to town for a box, and the answer was, "You can have it when you send the money." I quite agree that if we could possibly return to a cash basis we should get things cheaper; of course, first of all, we need one good harvest to make that possible.

Mr. PLUMMER: No doubt the farmers ought to pay cash, and they would do so if they were able. In our district (Bowhill) the farmers who took up land spent their capital in clearing, fencing, and buying machinery. Then came the bad seasons one after another, and we had to go to the storekeepers for credit. Mr. Dall has pointed out that poor land is a hindrance to successful farming, but since the introduction of manures some of it can be treated profitably. I have noticed that where manures and drills have been used on poor land, it gives crops equal to much better land which has not been fertilised. When I first went up the Murray there were people who held that the river lands could never be used for agricultural purposes; but it has in many places been most successfully cultivated, considering the seasons; for we have never yet had an absolute failure. I believe most of the poor soils near the river can and will be worked at a profit. Water carting is a very great hindrance, and farmers do not seem to learn that it would pay handsomely to put down wells or make tanks. The expense would not be nearly so much as that of water carting. There is evidence everywhere that fallowing is beneficial, and farmers are fast recognising the importance of it.

The GENERAL SECRETARY: I have more than once written to the Branches suggesting that they should consider whether it would not be worth while to club together, or to borrow money from the State Bank or elsewhere, and construct a large dam or reservoir in each dry district. The interest on £1,000 at 4 per cent., which is about what the State Bank charges, would be £40 per annnm, and that sum would construct a reservoir in a dry district capable of supplying water for several years in succession in case of a drought. If that were done it would mean a saving of thousands of pounds a year in water carting, besides the advantage you would gain from having the horses used for water carting available for *boná fide* farm work, The CHAIRMAN: What quantity of water could you conserve for £1,000?

The GENERAL SECRETARY: At Roseworthy, while Professor Custance was there, a dam was made for £200 which supplied water for the whole of the stock all the year round, while the immediate neighbors were carting water from Gawler, seven miles away. For £1,000 you could get a very much larger one, especially if the farmers did the work for themselves. At Roseworthy the work was done by contract, and you know contractors always charge more than farmers can do the work for themselves. Besides, it can be done at times when there is no other work to do on the farm. I was rather sorry last night to hear Professor Lowrie discouraging farmers from growing their own vegetables. He has no family, so he does not know what a family costs. Again, he lives close to the railway, and does not know the discomfort of having to do without such things, as many farmers would have to do if they did not grow them. A farmer can cultivate plenty of vegetables, in the winter time at any rate, with a small amount of labor, because, as he has plenty of land, he need not put them too close, and so he can use his ordinary farm implements for cultivation and thus do a lot of work in a little time. Then, if he is favored by Providence with plenty of youngsters, there is always someone available to do a little weeding, &c. Then why should not a farmer have the little comforts which come from keeping fowls, a dairy cow, sheep, or even pigs, for his own use? The credit system, I consider, is a very bad one indeed. I would rather go without butter to my bread than go into debt for it; for, once you get into debt there is no getting out of it as a rule. Credit is the worst hindrance a farmer can have.

Mr. STOTT: Many farmers seem to think if they chuck the wheat on the ground it will grow of itself, and never dream of taking the trouble to put a fine tilth on the land as they would for vegetables. Yet it is just as necessary to do this for wheat as for vegetables. As to credit, if a man has no crop he cannot let his family starve, and I do not think the General Secretary is quite right on this matter. A man is not always wrong in taking credit if he has reasonable prospects of paying.

The GENERAL SECRETARY: No one will give credit unless there is some security he can take if the debt is not paid. I have known many farmers sold up just because they had been able to get unlimited credit.

Mr. MCKENZIE (Minlaton): I think the General Secretary's remarks were just a little out of place.

The GENERAL SECRETARY: They were not intended to be in any way personal.

Mr. MCKENZIE: I think the storekeeper is one of the farmer's greatest friends.

A DELEGATE: That is very questionable.

Mr. MCKENZIE: In many cases the help given by a storekeeper has helped a farmer to keep his head above water and eventually recover himself. Farmers owe the storekeepers a great debt of gratitude, because when they cannot pay they get credit from the local man, which would not be given by the city merchant. Much of the paper is very true. To be successful a farmer must be as independent as possible, and grow all he requires for himself if possible. He must be able to do his own blacksmithing, building, shoe repairing, and in fact be generally a handy man. In my district twenty or twenty-five years ago hundreds of thousands of acres of apparently worthless scrub land were cut into blocks, but never taken up. Two years ago I took up a block at a rental of ½d. per acre, with a right of purchase at the end of twenty years for 5s. per acre, so that if it is not much good the cost is a trifle. I rolled down 140 acres last year and drilled and manured it this year, and now it looks good enough for 8bush. or 9bush. per acre. A block of this land makes a good addition to a homestead. There was no water on it; but the first thing I did was to dig out a tank, stone and cement it, and with one light shower of rain in the early part of the season I got it full, and it will do me till I have time to make further improvements.

The GENERAL SECRETARY: I hope not many of my friends have so thoroughly misunderstood my remarks as Mr. McKenzie. I did not intend to imply that the storekeepers are the farmers' enemies, because I know they have helped the farmers right through, and many have been ruined by doing so. It is not everyone who has the strength of character to refuse credit, and I am afraid many white men are much like the blackfellows in this respect. I have known a blackfellow buy an illustrated Bible, of which he could not read one word, just because it was offered to him on credit. The farmers, no doubt, intend to pay, but too often are never in a position to do so.

Mr. MOODY: I agree that if we can pay cash we should, but I do not think a farmer who has no money should refuse credit if he can get it.

The GENERAL SECRETARY: Nor do I.

Mr. MOODY: But there is a class of farmers of the old school who, rather than take credit, will sell their produce at any price which is ruling. In my district the bulk of the produce is hay, and it is impossible to put it all on the market at once after harvest without ruining prices. It is much better, therefore, to pay a little interest in order to enable you to hold on for a higher price. Fortunately I have not had much trouble over water as I have good wells, but I have neighbors near me in dry spots who have said it was impossible to get water on their land by sinking, and then have got good water, after a lifetime of water carting, by simply putting down a well. They have been carting for thirty years, and all the time the water was under their feet. Fallowing is a good thing, but does not always work out well, and a change of cultivation is often of more value. The farmer should always provide more feed than he thinks he will require, as the losses which have happened through running short of feed even in the better districts would have paid the farmers ten times over for the trouble of providing a little additional hay. Then, of course, if you do not want it you can sell it. I have always endeavored to keep over 100 tons of hay.

The GENERAL SECRETARY: You store a lot of straw don't you?

Mr. MOODY: Yes, I head all my wheat. I agree with Professor Lowrie that, unless a man has a plentiful supply of water, it does not pay him to potter about with vegetables.

Mr. SMITH: It is a difficult matter to get suitable land. It is not to be had in the South, and in the North the Government has made the blocks too small. In the Hawker district many families have been brought up on farms of 500 acres, but that is too small when the family grows up and the sons want land for themselves. There is a vast territory in the North capable of carrying a big farming population, but until the blocks are made larger we shall never get the people. The storekeepers encourage farmers to get into debt so that they may charge higher prices for their goods. When I started I paid cash, but the storekeeper induced me to open an account, and I found at the end of the year I had been paying 25 per cent. more than I would have had I paid as I went on. When the harvest came I could not pay, and it went on so for three years, when I was able to get square. From that day I have never had a farthing credit; and I advise all farmers to do the same. Then there is the 10 per cent. interest which is charged for credit. When I was starting a man induced me to buy a reaper—which I did not really want—on credit. Before I paid for it it cost me £70, through compound interest. The original cost was £50, and I have bought a better one since for cash for £30. As to water, there is hardly a farm in the district of Hawker not permanently supplied with water. We tried dams but they did not answer, and then we got good wells. A man with a divining rod showed me where to put mine down.

A DELEGATE : Do you believe in the divining rod?

Mr. SMITH : All I know is that when I sank where he told me I got water, and good water too. I might have got it without the rod, but it must be remembered that Hawker is a dry district. A mile from me a well was sunk 105ft. deep and struck salt water. On the advice of the divining-rod man, he sunk another well a few yards away and got good water at a much less depth. We have not had much wheat lately; but we have had a lot of cocky chaff. That may seem poor feed to southern farmers, but all our harvest work has been done on it.

A DELEGATE : Do you put pollard with it?

Mr. SMITH : No; we cannot afford it. Cocky chaff is not so bad, though. I have known horses to refuse hay chaff while they could get the other. Then we sprinkle salt on the straw and stack it. I do not know that there is much nutriment in it, but it fills up. (Laughter.) A good deal has been said about farmers not saving the straw in good years; but how were we to know we were going to have such droughts? I have known farmers to be in such straits for feed as to pull the straw off the shed roofs and give it to the horses. The horses always died.

The GENERAL SECRETARY : I quite understand that straw that has been exposed to the sun for several years contains absolutely no nutriment, and that is why they died. Straw cut at harvest time with the binder, and stacked, is within 15 per cent of the value of wheaten hay; but when you leave it exposed to the sun it loses all its starch, sugar, gum, oil, and aroma, and there is nothing left but vegetable fibre. That is no good for feed.

Mr. E. COE (Gladstone): What size farms does Mr. Smith advocate for the North, and what size are they now?

Mr. SMITH : They are now from 300 to 1,000 acres. What we want, with much of the land, is from 10,000 to 20,000 acres. If we could get 20,000 acres we could combine grazing with agriculture. As for large population, look at the vastness of the work.

The GENERAL SECRETARY : Why, the squatters were as thick as the farmers would be on blocks that size.

Mr. J. B. Rowe (Quorn): The greatest hindrance a farmer has is want of capital, and I do not agree with those who run down borrowing. The men who have succeeded best are those who have borrowed capital. In the dry country, too, you must have stock and sufficient land to keep it on, or you will be sure to go to the wall. I got water in an unexpected place through a divining-rod man. I only paid him 5s., and would have been glad to pay him £5 if I had been certain of finding it. As to vegetable growing, if you have good water fence a small area in and plough it up and work it, and you will find that the ladies of the household will keep you in vegetables. During the ten years I have been at Quorn I have not paid 5s. for vegetables, and the ladies have done all but the hard work.

Mr. F. B. RATHBONE (Davenport): I think farmers should go in more for poultry. You can go through the country and have the greatest difficulty in buying a dozen decent fowls or a hundred eggs from a farmhouse. Nearly all the colony is eminently suited for poultry farming, and feeding them even with whole grain will pay better than selling it; but you can use the waste wheat. I do not say farmers would make a big thing out of it, but there will be always eggs available and fowls for fresh meat, and an addition to income besides.

The GENERAL SECRETARY : The kind of poultry should be those suitable for export.

Mr. RATHBONE : Yes; I would strongly advise farmers to go in for that trade.

Mr. **Correll**: I do not think enough attention is given to fallowing in wet seasons in the North. It is possible to do a good deal towards conserving the moisture in this way. A few years ago scarcely a farmer in our district did any fallowing; now they nearly all recognise its value.

Mr. **Smith**: We recognise the value of fallowing all right and practice it, but we have not yet had the wet seasons. I have tried keeping fowls, and I quite disagree with the idea that it will pay us to feed them on wheat. We are getting 5d. a dozen for our eggs now.

Mr. **Rowe**: I do not think manures will do in the Far North. I tried some this year, and for a time the fertilised crop did well. Just before the last dry spell it was 6in. higher than the unmanured; before the late rains came it was 6in. lower.

Mr. **Dall**: I do not think Mr. Rowe is right in saying that manures will not do in the North. (Cheers.) I come from a dry district, and I have found English superphosphate do very well. I did not condemn a man for taking legitimate credit, and do not think for a moment that it is unwise to accept help when you need it if you can get it. Farmers must borrow: because, if a man has enough money to buy land, build on it, fence it, clear it, and get implements, &c., he has enough to live on, and has no need to go farming. While I would like to see the size of holdings increased, I think 20,000 acres of arable land is more than is needed for a farm. If a man has 3,000 acres of good land he will be all right, though if he can also get some rough land for stock let him do so by all means. Some three years ago, when wheat was only 1s. 10d. a bushel, I borrowed sufficient money from the bank to enable me to hold on to it for a time, and eventually sold it for 4s. It paid me very well to borrow that money.

Vote of Thanks.

The **General Secretary**: I move a cordial vote of thanks to each and every person who has assisted in making the Congress the success it has been. One thing I was very sorry for. I saw one gentleman, whom we respect very much, go away in a huff when the Chairman refused to put to the meeting a vote of thanks which he seconded. He has not been here since, so I have had no opportunity of explaining to him that, to save time, we decided to have only one comprehensive vote of thanks. I do so now, so that he will see it in the pages of the *Journal of Agriculture*. (Cheers.)

Mr. T. **Jacobs** (Cherry Gardens): It is with great pleasure that I rise to second the motion. I have been very pleased to be here, and have learned a lot. It is not entirely satisfactory to me that I should have received all and given nothing, but if you are content I am. (Laughter.) On another occasion I hope the practice of opening the Congress by a partly political address will be dropped. I know if the Branches introduced politics into their meetings nine out of ten of them would be broken up in no time. (Cheers.)

Mr. **Rankine**: I have much pleasure in supporting the motion. The papers I have heard read were very practical and useful. There has not been time to deal thoroughly with all of them, but we shall have an opportunity of discussing them at the branches. (Cheers.)

Mr. **Smith**: I also support the motion. Such a meeting together of southern and northern farmers must result in some good being done. We have got some information as to what our southern friends are doing with manures, and, if we get good seasons, we may try them in the North. The papers read are well worth earnest consideration. I wish specially to thank the General Secretary for his uniform courtesy to the honorary secretaries. If we want any information no trouble seems to be too great for him to take in order to supply it. (Cheers.)

Mr. **Venning**: I wish the General Secretary would not cut down papers sent for publication in the bureau reports so much. He seems to cut out the practical parts and leave only the theories.

The **General Secretary**: When you consider that we have 106 branches, many of whom have live members who read papers every month, I think you will admit that the work of editing the *Journal* is not enviable. I wish I had Mr. Venning doing it for about a week. He would die. (Loud laughter.)

The motion was carried.

The **Chairman**: Gentlemen, on behalf of all included in the vote, I thank you for it.

Mr. **Rathbone**: I would like to move a vote of thanks to the Minister of Agriculture for granting free passes to the delegates. Much of the success of the Congress is due to that.

Mr. F. **Salter** (Angaston): I second that.

The motion was carried.

Open Parliament.

An open parliament for 10-minute discussions was held.

Ear Cockle in Wheat.

Mr. **Plummer**: The ear cockle on the table comes from our district, and I want to prevent it spreading, as if it spreads it will be a great detriment to the wheat-growing industry. About four years ago it was first noticed, and we did not know what it was till we sent it to the Central Bureau. It attacks wheat plants, causing shrivelling of leaves and ears.

The **General Secretary**: Ear cockle is caused by a very minute worm coiled up in the grain. When infested grain is sowed the worm will ascend in the body of the plant till it gets to the ear, where it goes into the grain again. There are many thousands of these worms in each grain, and they are very tenacious of life. The only way to get rid of it is to go through the crop and pluck out each affected stalk and burn it.

A **Delegate**: Can you discover it by the appearance of the plant?

The **General Secretary**: Oh yes.

Mr. **Plummer**: If this disease is not checked I am sure it will soon be found all over the colony. In two years it has spread to nearly all the paddocks in our district. It can be prevented by using only wheat in which there is no ear cockle, as it is only in the wheat and not in the ground. I have proved that conclusively by experience.

Professor Lowrie: I know very little about ear cockle. I had no idea it was in South Australia.

A **Delegate**: About seven years ago I had a crop thinned out badly by some pest that looked very like that. I did not know what it was, and I could not find out.

Professor Lowrie: It was known in Europe years before we were born. I am very sorry it has come to South Australia.

Better Working of Branches.

Mr. **Correll**: Something has been said about the reports being cut down by the Secretary, but I would like to defend Mr. Molineux. In some cases the secretaries do not send reports in at all. I never had any fault to find with the condensing of the reports, and I think he always gives the gist of the matter. In my opinion a great deal better work could be done by the branches if the secretaries will have a number of subjects ready for discussion at the meetings.

Mr. **Salter**: Is the number still limited to fifteen members?

The **General Secretary**: Yes.

Mr. **Salter**: That is rather unfortunate, as in our district there are several good men who want to join.

The **General Secretary**: They can attend the meetings, and do just as much good as if they are members. Only they will not get a free copy of the *Journal of Agriculture.*

Mr. **Salter**: Could you not allow those who pay a subscription to become members?

The **General Secretary**: The membership is limited so that it will not be made too cheap. If we let everyone in, people could join as easily as they can be made J.P.'s. A branch is an advisory board for the district in which it is situated, and the Central Bureau is an advisory board for the whole.

Mr. **Venning**: And they do it all in Adelaide.

Do Phosphates Exhaust the Soil?

Mr. **Rankine**: It is said by some people from the old country that where superphosphates have been used for years they have the effect of running the land out. Is there any truth in that?

Professor Lowrie: This is a question which has been put to me again and again in the country, and I always endeavor to answer it in a way that will give confidence. It is, of course, quite a mistake to consider that the application of manure exhausts the land by stimulating it. You will exhaust it if you continue cropping it year after year without returning to it some of the plant food the crops take out of it. If you manure judiciously there is not the slightest fear of the land being rendered ultimately barren. This can be proved to the greatest sceptic by the work of Lawes & Gilbert, at Rothampstead, where every year for sixty years a crop of wheat has been put in. The average obtained has remained from 40bush. to 43bush.

A **Delegate**: Does it get a heavy dressing?

Professor **Lowrie**: Yes; a heavy dressing of phosphates, nitrogen, and potash.

A **Delegate**: It is better than when they started.

Professor **Lowrie**: Of course. The only thing is that it is rather more difficult to keep clean of weeds. I think what Mr. Rankine refers to is something which has been put about by those who have axes to grind. They are selling guano or other manures, and they tell the people that if they continue using super. alone the land will become barren. To a certain extent it is true, because by taking heavy crops year after year and only adding phosphates you might exhaust the nitrates and potash, but then all you have to do is to add these also. You can easily find out what is required by a few experiments. All the same, I know of one place where five crops were grown in twelve years on the same land with nothing but superphosphate, and they got an average of 20bush.

A **Delegate**: What was the rainfall?

Professor **Lowrie**: Seventeen inches.

A **Delegate**: I have heard farmers say the manuring for wheat spoils the grass afterwards. Is that so?

Professor **Lowrie**: Quite the contrary. If you miss manuring a turn of the drill in sowing the crop, you can see where it was next year by the comparative shortness of the grass. Phosphates make the trefoil grow rather heavily, and that, from the point of view of the sheep man, is a disadvantage, but they make the other feed grow also.

Wheat and Frosts.

Mr. **Dall**: This sample of wheat has been sent from Laura to find out whether it has been hurt by frost. It was grown near Stone Hut. I would like to have an opinion about it.

Mr. **Stone**: Our district is one of the earliest districts in the colony, and our wheat has been in ear about two months. We had about three weeks of sharp frost, and in some of the paddocks about a third of the wheat is frost bitten. There is nothing in the grain. The Baroota wheat seems to be the worst. I have a paddock of 150 acres, half of which is sown with Gluyas, a very early wheat, and it has not suffered in the slightest. The other half of the paddock, which is bearded wheat, which came out a little later, is frost bitten. I put it down as much to the want of rain as to the frosts. Both came out in ear during the frosts.

Professor LOWRIE: A good deal of this wheat here, I think, will fill. It seems fertilised right enough. I think they may get a good crop off it. I had an experience of wheat suffering from frosts eight or nine years ago. The plants grew early and rank, and looked, judging from the straw, good enough for 25bush. or 26bush., but I only got two bags. At the time I blamed the frosts; but I do not think it can be the frosts so much, because we know that in Canada and other parts of the world you may have 18° of frost, and yet the wheat get practically no harm. I think it is the sudden falls of temperature we sometimes get here, when the wheat is out in bloom, that do the damage. We get 72° in the shade at midday, and perhaps it is freezing at midnight. If you get one of these days just as the wheat opens I believe your crop will suffer. However, I am not much of an authority on the subject, because I only had it one year.

Mr. STONE: Don't you think the long spell of dry weather may have had something to do with it?

Professor LOWRIE: I remember in the Black Rock district in 1891 they had plenty of rain, and the crops were as high as the fences, but they were thought to be no good for wheat, and were cut for very second-rate hay. Another crop, though, which looked the same at hay-cutting time, was left, and they got 15bush. or 16bush. to the acre from it. So you see we can make too much of a bogey.

The Header.

Mr. RANKINE: I feel very strongly on the question of the header. Last year I believe it was the means of reducing very greatly the value of hay. The farmers have got into a habit of taking the wheat from a crop with a header, and then selling the straw as presumably good hay.

The Central Bureau.

Mr. STONE: I think we should hold this meeting a little earlier. I had, very unwillingly, to come away during haymaking to attend it.

The CHAIRMAN: If we did we should not get the attendance. The delegates want to see the Show.

Mr. STONE: I think it would be advisable to have a man from the North on the Central Bureau.

The GENERAL SECRETARY: We have Mr. Miller.

Mr. STONE: Go further North. I think all that a representative would want would be a free pass. He would be of immense benefit to the Bureau. All the members should be to all intents and purposes producers.

The GENERAL SECRETARY: So they are.

Mr. STONE: Except one—Mr. Price. If he is connected with an agricultural industry I will willingly withdraw what I have said

Mr. PRICE: I do not think I need defend my appointment with the Bureau. (Hear, hear.) I was certainly not appointed for any political reason. Although I have been a mechanic all my life, in anything concerning agriculture and gardening in particular, and in growing fruit, I believe I could beat anyone in this room. I have a lot of market gardeners in my district, and I am on the board in their interests. I think, however, that the time has come when the Central Bureau should be elected by the branches. There are men on it who never attend, and who should have been off long ago. The Minister has not the courage to wipe them off, and a Minister who has not got enough pluck for that should be removed and another put in his place.

The GENERAL SECRETARY: The members in the first place were selected because they lived near Adelaide, and because they were men specially qualified to advise on every branch of agronomical industry. If we had elected members it would mean adding to the expense, and we should have to send into the country to the members for advice when questions come in as they do nearly every day. I do not think the Secretary would be justified in answering some of them without submitting them to the Bureau. I think it would be a very great mistake to have an elected Board. If it was elected as in Tasmania, or nominated as in Western Australia, it would simply be a nonentity.

Mr. STONE: Our Branch is certainly perfectly satisfied with the Secretary, than whom no more energetic man could be found anywhere, but we do not think the Bureau should be composed entirely of Adelaide men.

The GENERAL SECRETARY: Their interests are not in any way antagonistic to those of the country dwellers. It is not meant to be a representative board. All the best men in the colony in their respective lines are on it, and if there are good men in the country districts they are able to do good work in the Branches.

Mr. VENNING: I move—"That the Branches be asked if they approve of an elected board."

The motion was not seconded and lapsed.

Mr. STONE: I move—"That this meeting has every confidence in the Central Bureau." My opinion is that the men nominated to it have given general satisfaction, and that if this motion was put to the Branches they would all adopt it. (Cheers.)

Mr. H. WISHART (Morgan): I am sorry the discussion has taken such a personal turn. The Murray Branches have every confidence in the Bureau

Mr. COE: Our Branch has full confidence in the Bureau and in the recent appointments also. We have found it difficult to get members to come fifteen miles to attend Branch meetings, and there would be great difficulty in getting country members to attend the Bureau.

The motion was put and carried unanimously.

FRIDAY EVENING.

A Conversazione.

A conversazione was held in the Trades Hall on Friday evening, to mark the close of the proceedings. The Minister of Education, Hon. R. Butler. M.P., who presided, explained that they had decided to hold the engagement for the purpose of bringing the members together so that, by social intercourse, they might become more closely acquainted one with another. The Hon. J. L. Parsons delivered his popular lecture on "Japan," illustrated by limelight views, and his remarks were followed with the keenest interest. Mr McColl, of Richman's Creek, proposed a vote of thanks to the members of the Central Bureau and to the Minister for having provided such a pleasant evening, and he thought it would have the desired effect, because he was sure they had got to know each other better. This was carried Mr. T. Price, M.P., who responded on behalf of the committee which had been appointed to arrange the conversazione, thanked the Minister for having given them permission to spend a small portion of the money granted to the Bureau by the Government. Mr. Parsons was also tendered a vote of thanks for his lecture. During the evening songs were rendered by the Hon. G. McGregor, M.L.C., and Messrs. E. L. Batchelor, M.P., Pomeroy, Osborne, and Ford.

CONSTRUCTION OF POULTRY HOUSES.

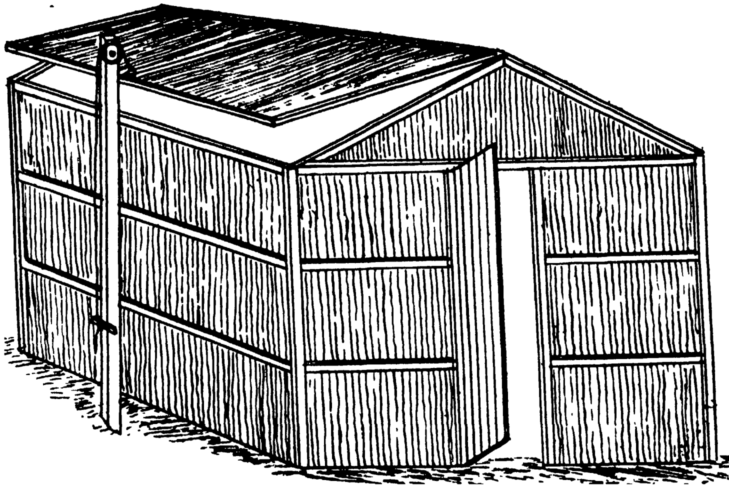
By Mr. R Storr, Port Broughton Branch.

Owing to the presence of the dreadful fowl tick (Argas reflexus) in some parts of this colony, it is necessary to make special provision for dealing with the pest. These ticks hide principally about the houses in which the fowls take refuge at night, or under the bark of trees, or crevices and crannies where the birds roost; but they also attach themselves to the bodies of the poultry, chiefly on the bare parts beneath the wings and between the thighs and body.

Poultry houses may be built with teatree bush, bagging, stone, sheet iron, concrete, pisé, or pug.

There can be no doubt that stone walls are the best, if smoothly plastered inside, so that the walls can be frequently lime-washed, and it is also capable of being made sufficiently airtight so that the interior can be fumigated with sulphur or cyanide of potassium for the purpose of destroying all insects and ticks.

The roof of every fowlhouse should be provided with a contrivance on hinges, so that a portion can be raised, in order to ventilate the house when necessary. The hinges should be affixed to the ridge pole.



In this locality the limestone rubble, such as is used in making roads, can be used for making so-called concrete walls, by simply mixing it with water, and then fill between boards set at the width intended for the walls. The roof should be made as before stated. The walls must be plastered both inside and outside with good plaster.

Sheet iron, galvanized or plain, makes a very good fowlhouse; but the whole of the framework should be put up first, roof and all, so that the iron can be affixed on the inside, thus presenting an even surface for the frequent lime-washing which is necessary. If the framing is built inside the iron, it will be impossible to place the hot limewash between the wood framing and the iron, and the ticks and lice will congregate there in myriads.

If the house is made of bagging, the cost will be very small, and should the ticks gain the ascendency, despite all precautions, the whole place may be burnt down with but little loss. Such a house should be constructed on the same principle as one of iron for the walls and with roof of iron. When erected, give the walls two coatings of whitewash, made with ½bush. of good quicklime, 3lbs. dark sugar, 4lbs. salt, and enough water to make a thick wash; apply with a brush. This will make it air-tight and water-proof.

The roosts should be of flat wood, 3in. x 1in., laid crosswise on to two stronger pieces 3in. x 2in., running lengthwise of the house, slung by wires to the upper part of the roof, with a bottle-neck round each wire having a little kerosene in each to prevent the ticks coming down the wires to the fowls. Care must be taken that none of the ends of the roosts or supports touch the walls. Each end of the suspending wires should be hooked through loops on the ends of the supporting beams, so that the perches can be turned upwards to allow of cleaning the house. The perches should be all on one level, and 12in. to 14in. apart, so that no quarrelling shall take place among the fowls for the highest position, and to prevent the defilement which is inevitable where the birds roost one above the other. The low flat perches will prevent crooked breasts and several other evils.

POULTRY NOTES.

By D. F. Laurie.

The Incubator.

On various occasions I have been asked to contribute an article on the manufacture and working of a reliable incubator. Hitherto the necessary time has not been at my disposal. In bringing before readers the machine as here described and illustrated, it may be as well to state that it has stood the test of time in every way. After a long experience, during which I have used many different patterns of incubators, I have become confirmed in my opinion that this machine, constructed as it is on scientific lines, is as near perfection as need be. There are other good incubators, but this is more simple in construction, and combines all the good points of others. It is hardly necessary to go into the history of modern artificial incubation, beyond saying that the first European machine was constructed during the latter portion of the last century, and since then steady progress has been made, until we have machines which are more reliable and cheaper in every way than hens themselves, especially where the operations are extensive. Artificial incubation was practised by the Chinese and Egyptians centuries ago. There is now in Hindley Street a Chinese hatching oven, at which large numbers of ducklings and chicks are hatched. Up till, say, the last fourteen or fifteen years the average incubator was troublesome to work, owing to the absence of a reliable automatic regulator. The motive power of nearly all regulators to-day is the metallic capsule containing sulphuric æther and alcohol (one in eleven). Æther boils at about 95°, alcohol 112°, so a blending of the two will give a mixture with a boiling point somewhere between these two. This is a simple affair, and (although somewhat susceptible to barometric pressure) is, on the whole, the best. I have experimented with numerous other agents, including electricity. Concerning the latter, an enterprising firm, not now resident in Australia, pirated my invention, and sold a large number of machines of my pattern and so regulated. These were not a great success, as I did not disclose full particulars. The cost of the electric plant and its unsuitability for those unacquainted with electrical knowledge were the means of directing my efforts, which resulted in this machine, which I first used some twelve years ago. I think the explanation and the five illustrations herewith should enable anyone to construct this machine. All that is required are some carpenter's tools and a soldering kit. The casing may be made of any timber, as long as it is not less than ⅝in. thick, and well seasoned. Flooring boards or pine shelving will be found excellent. This can be stained and varnished, and looks well. As there is a good deal of variation in temperature, the work must be solid or the machine may twist and warp, and crack badly. Care must be taken to allow free play for all pipe and other openings in the casing; a tight fit may result in disaster of some sort. The boiler, tanks, &c., may be of best 24 gauge galvanized iron or 28 gauge copperplate. The latter will last for an idefinite period, while the former may get pitted with holes in a few years. Whatever the material, boiler, pipes, and tanks, must be of the same, or chemical action will result, and the joining metals will perish and cause leakage. The machine as here drawn is of a capacity of about 150 average hen eggs, or 110 to 120 duck eggs. This is a convenient size, and costs very little more in kerosene than one of fifty eggs' capacity.

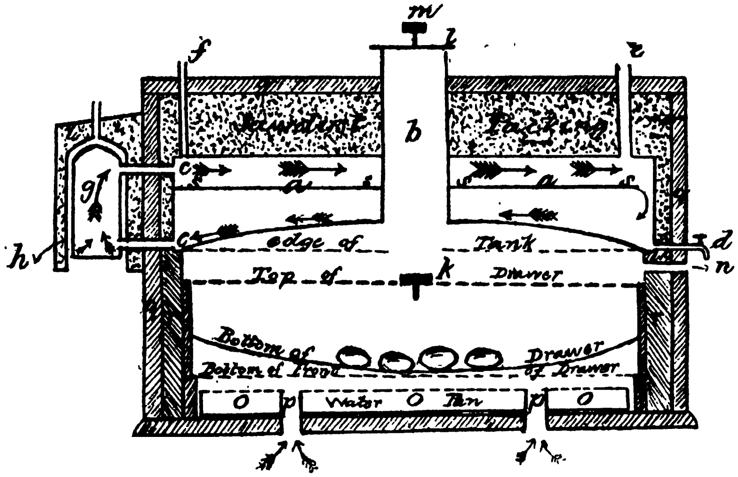


FIG. I.—LONGITUDINAL SECTION.

(Scale, 1in. to 1ft.)

All sketches are to the scale of one inch to one foot (1in. to 1ft.), that is, the drawings are one-twelfth natural size. In larger or smaller machines the packing and internal vertical dimensions may remain the same: thus, if one wants a 75-egg machine, take the measurements as one-sixth actual size; if a 300-egg machine is required, take the measurements as one-twenty-fourth actual size, and so on. In Fig. I. a longitudinal section is given showing a line through the centre of the machine, longwise. Here we see the casing (*q*), which is here shown 1in. thick; (*r*) is the double casing surrounding the egg chamber and drawer, and on which the tank (*a a*) rests. It will be seen that the bottom of the tank (*a a*) is domed and that the bottom of the egg drawer is dished. The reason is this: if the bottom of tank and bottom of egg drawer were both flat the eggs in the centre of the drawer, by reason of many additional rays of heat, would be subjected to a greater degree of heat than those at the edge or away from the centre of the drawer. By dishing the drawer and doming the bottom of the tank we increase the distance in a gradual curve from the centre towards the outside, so that by this method each egg receives the same amount of heat, and there is no necessity to change the positions of the eggs. The truth of this can easily be proven with the aid of long glass or self-registering thermometers. In this machine the result will be a uniform temperature all over the drawer; in a flat-bottomed drawer and with a flat tank there will be zones of heat, decreasing as the edges of the drawer are approached. I have thoroughly proved this, practically and theoretically. The dotted line shows the bottom edge of the tank when viewed from the front. The construction of tank and boiler is simple, and to explain it we must also look at Fig. II., which shows a cross section—that is, a cut through the middle of the machine at right angles to the previous section in Fig. I. This shows the other view of the tank, the dotted line showing the bottom edge of tank when viewed end on. In Fig. I. (*ss*) is the diaphragm, placed about 2½in. from top of tank. This diaphragm is soldered and stayed to the tank and round the flue (*p*) in the centre, but does not extend to the end opposite the boiler. A space of 1in. is left here, for the following reason: The boiler (*g*) is what is termed a double-jacket boiler, very simply made; as will be seen, it consists of a plain metal boiler, 3in. in diameter and about 6in. in height; (*c c*) are the inlet and outlet pipes into and from the tank. The outer jacket (*h*) consists of a metal cover of such size that there is a space of less than ½in. all round the boiler; (*i i*) is asbestos or cowhair packing. The lamp is placed under the boiler (*g*) (the machine being previously filled with very hot water, as hereafter described); the heated water rises and passes through the top pipe (*c*) into the tank, flowing, by pressure of the constantly rising hot water, in the direction of the arrows, and eventually passes over the free end of the diaphragm into the lower compartment; in the same period the rising of the heated water causes the cooler water from the lower compartment of the tank to flow into the boiler to replace the expelled heated water, and thus a very perfect circulation is established. The use of the outer jacket is obvious; were only the bottom of the boiler presented to the flame of the lamp, the heating surface would be limited, but with the double jacket the heat passes over practically the whole surface of the boiler before it reaches the small chimney at the top. The inlet pipe (*e*) may be about 1in. in diameter, and need not be closed; (*f*) is an escape pipe for air, gas, &c., which frequently forms owing to the water in the boiler getting very hot. The outlet, which may be a tap or a dead-end (*d*), is for emptying the tank when necessary. The flue (*p*) in the centre of the machine acts both as a ventilator and as a means of equalising the temperature with the aid of the regulator. The sawdust packing round the tank must be rammed and pressed in very firmly, and it is as well to block the tank in position by means of fillets, so that it cannot shift. The inlet and outlet pipes (*c c*) may be from ¾in. to 1in. in diameter. The flue (*p*) is 4in. in diameter for a 150-egg, 3in. for a 75-egg, and 6in. for a 300-egg incubator. All angles of tank should be well stiffened, and the whole well stayed with round hollow stays of the same metal as tank; every joint must be strong and perfectly watertight. In a larger machine I should recommend longitudinal cradle bars bent to the exact shape of the bottom of the tank, so that it will have a true bearing. The egg drawer must be firmly framed, glued, and firmly stiffened with metal angles at the corners inside; the bottom may be of fine meshed wire netting, and on this a piece of porous old blanket may be placed, and the eggs rest thereon. The dotted lines on Fig. I. show the respective positions of top and bottom of front of drawer when viewed from front of the machine. Underneath the egg drawer, and extending over the bottom of incubator, is the water tray or pan (*o o*). This may be kept raised on two slats of wood, about ½in. from bottom of machine; this will allow a free entrance and dispersal of the air which enters from a number of ½in. holes which may be bored 4in. apart all over the bottom of the casing of the incubator. The large holes (*p p*) are 2in. in diameter, and should be covered with wire gauze; in fact, where blowflies are prevalent it will be necessary to protect all openings and ventilators in a similar manner. The water pan or tray is a flat vessel, say, 1½in. deep. Exactly over the holes (*p p*), there are openings in the pan formed by soldering in two rings of metal rather higher than the edge of the pan; over th se holes a piece of porous cheesecloth is spread. This remains damp, so that all air entering the holes (*p p*) becomes moistened before reaching the bottom of the egg drawer. In Fig. I. there is shown a ventilator (*n*), and on reference to Fig. IV., which shows a view of a completed machine, it will be seen that there are a good many similar ventilators all round the machine—the same at back and both ends, and as shown in front. In Fig. I. (*l*) is the regulating damper, also marked (*f*) in Fig. II., and (*m*) is a section of the top rod of the regulator marked also (*e*) in Fig. II. A reference to Fig. II. shows us that the tank is domed, and the bottom of egg drawer dished in their shortest diameter as well as the longest.

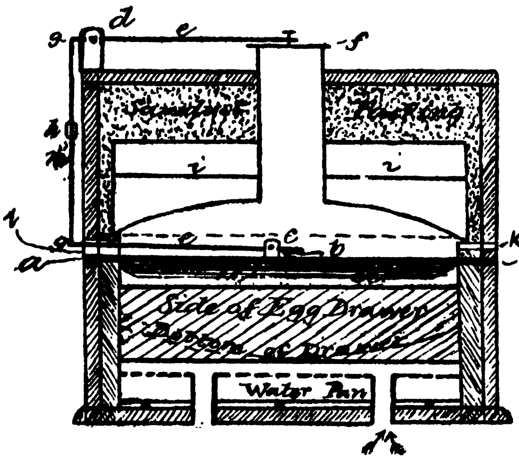


FIG. II.—CROSS SECTION.
(Scale, 1in. to 1ft.)

Here again we see a section of a ventilator (*k*), and also the relative position of the side of egg drawer. The chief intention of this view of the machine is the side view it gives of the regulator in actual position. Here we see a bar of T-iron (*a a*) extends from front to back of machine and over the egg drawer; this is what carries the regulator rods and capsule. The section should be not less than 1in. in web and flange; this section may be made by brazing two pieces of iron 1in. x ¼in. at right angles, bevelling ends, as shown in Fig. II. This bar is fastened in front of machines at top of drawer opening, by housing flush into the woodwork, and then securing with a stout metal (iron or brass) plate, screwed, so that it can easily be detached. The bar is housed into the casing at back of machine; thus the bar is easily removed if required. The position of this bar will be seen in Fig. I. at (*k*). I may here say that capsules, also long glass thermometers, price 3s. 6d. each, of excellent manufacture, can be purchased at Messrs. Vardon & Hercus, engineers, Flinders Street, Adelaide. This intimation will save me answering such an inquiry. No doubt they would make the rods if beyond the reader's powers, although it is very simple to do so. The capsule in Fig. II. is marked (*b*). (*c*) is the axis where the bottom rod (*e*) is pivoted; its turned down end rests on a little solid lump with a depression in the centre, and which is soldered on top side of capsule. It is as well to solder or braze on a plate of metal 2in. square on the rod (*a a*) for the capsule to rest on. (*m*) is the connecting rod between the top and bottom rods; it is hinged at (*g g*), and is supplied with a coupling piece (*n*) which is screwed, and is of use for regulating the temperature. (*d*) is the top axis or pivot, the axle being placed 1in. from the end of top rod (*e*). The axle on bottom rod (*e*) is placed 1½in. from turned down end (see details, Fig. III). (*f*) is a circular disc of thin metal, which is attached by a loop or otherwise to the end of rod (*e*), which may be tapered so as to reduce weight; this disc (*f*) should project ⅛in. all round the top of flue. The action of the regulator is as follows: When the temperature registers 102°, or thereabouts, in the egg drawer, after the machine is well warmed, as hereinafter described, place the capsule on the little platform at (*p*), Fig. II. See that it has a fair and level bearing, and that the end of the bottom rod (*e*) is in the depression on top of capsule. Then, if the rods are of the proper dimensions, a few turns of coupler (*n*) one way or the other, as necessary, will shorten or lengthen the regulator rods, and so cause the damper (*f*) in Fig. II. to balance lightly on top of the flue marked (*b*) in Fig. I. If the temperature in the egg drawer should increase, the capsule will expand, and by forcing up the end of the bottom rod at (*b*) depresses the end (*g*), and, of course, pulls down the end of top rod (*c*) at the point (*g*), thus raising the damper (*f*) (*vide* Fig. II.), and allows the excess of heat to escape; the capsule then resumes its normal shape at the temperature it is set at, and the damper again rests lightly on the top of flue (*b*), Fig. I. In actual practice, with a well-balanced machine, no motion of the regulator is perceptible, and there is consequently no appreciable variation of temperature, excepting that due to barometric pressure. Fig. III. shows the three portions of the regulator rods, with dimensions figured, for a 150-egg machine. For a smaller one I should advise the same lengths, so as to get the necessary travel of damper. In such a case the bottom rod will project from the opening (*l*), Fig. II., several inches. The top rod must be fixed at axis (*d*), Fig. II., on a block of wood of a thickness in proportion to the projection of the bottom rod.

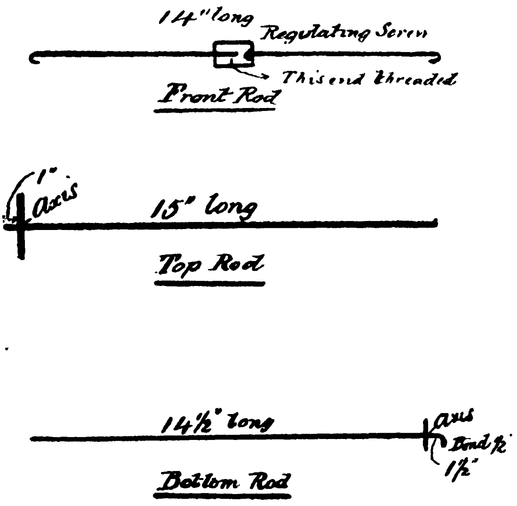


FIG. III.—REGULATOR RODS.

The Fig. III. explains itself. The top and bottom rod may be of iron, ¼in. square, and wrought quite true. The front rod may be made of steel wire, the ends turned in a hook, which will fit into notches in top and bottom rods, thus making a good hinged joint. The axles must be soldered to the rods, and the bearing portion filed to a knife edge and "stopped," so as not to slide about and come out.

Fig. IV. shows a view of the machine as completed. The boiler is at farther end in this case. In Fig. I. it is shown this end. This figure explains itself: (*a*) is the front of the egg drawer; (*b*) is a movable front, fastened with buttons at (*c c*); on removing this the water pan can be removed and filled with water, cold or warm, without opening the egg drawer. The ventilators can be finished with brass eyelets, and can have a brass cover fitted on so that they may be closed or opened wholly or partially, as required. The regulator rods may be of brass or any desired metal.

The machine should have a stand of a convenient height, and strong, as when in working trim it will be very heavy.

I have here given a full-size detail of the axes (*c*) and (*d*) in Fig. II. This will aid in making a good job. If the axis is too narrow there will be a side motion, which is not desirable.

A cellar is the best place for any incubator; it should, however, be well ventilated. If not available, place the machine in a room where there is as little traffic as possible, as any jarring has a prejudicial effect on the embryos in the eggs.

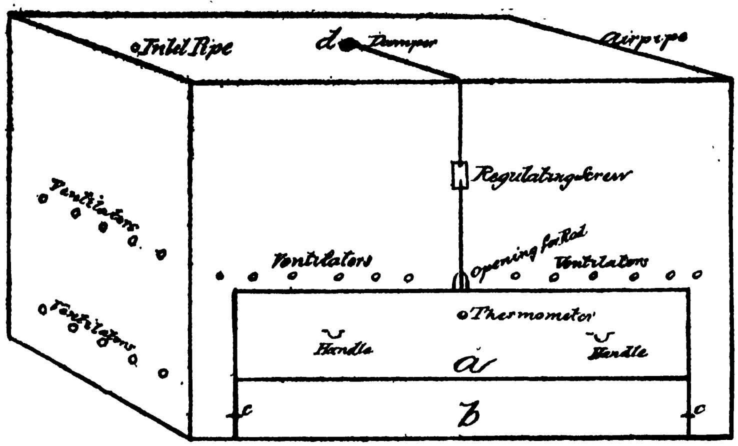


FIG. IV.—ELEVATION (FRONT SIDE).
(Scale, 1in. to 1ft.)

The best lamp to use is the ordinary Bismarck reading lamp, with the 2½in. circular wick; burner and collar can be purchased at any store for a couple of shillings. Cut off the part which holds the globe, and solder the collar on to a metal receiver; cut the wick quite true and level; dip in kerosene before lighting, and then you will have a perfectly safe, reliable lamp, the most powerful and economical of any I know of. This is quite strong enough for a big machine, if not placed in a draughty position. Obtain sufficient boiling water (first take the capsule out of the machine), then with a funnel gradually fill the tank, rocking the machine gently from time to time to expel gas, air, &c. By using boiling water the machine soon gets thoroughly warmed all through. The packing, &c., absorbs a considerable amount of heat. In the end it will be found to run much steadier. The lamp may now be lighted and placed in position, and given, as it were, a trial run. Turn the lamp up gradually. There should be at least half an inch space between the top of lamp-glass and bottom of boiler. It will be necessary to affix a lamp stand to stand of machine; flat pieces of wood of varying thickness may be used to raise or lower lamp as required. Even then it will be noticed that there is a tendency to an increase of flame through extra draught, &c., so due precautions must be observed till you know all about it. On no account must the lamp be turned so high as to smoke. This will cause a deposit of soot in the form of lampblack, which is such a good non-conductor that but little heat will reach the boiler so protected. After, say, six or seven hours the temperature may be allowed to gradually drop, till at the end of, say, ten or twelve hours it is from 102° to 103°. The capsule may now be placed in position and the regulator adjusted. When the temperature remains steady, say at 102°, the eggs may be placed in the drawer. Each one should be marked, so as to facilitate turning. The thermometer,

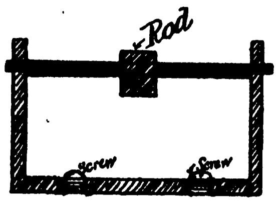


FIG. V.—DETAIL OF AXIS.

as shown on Fig. IV., passes through the front of the egg drawer and rests on the top of the eggs, thus noting the true temperature at that point. Any other temperature is not of any use. Turn the eggs twice a day, allowing them to remain till cool, but not cold. Test for fertility on fifth or seventh day, and again later. Place warm water, say of 120°, in the water pan twice a week. Do not sprinkle the eggs. Do not handle the eggs with kerosened fingers. Sudden jars, bad smells, &c., are fatal to success. Numerous amateurs have made machines of this pattern, and I known of no unsuccessful person. The chickens are strong, healthy, and vigorous, and, if not unduly coddled, will grow rapidly into fine birds. Artificially-hatched stock is just as good as that hatched naturally.

Notes on Show.

A good many readers of these notes were present at the recent Royal Agricultural Show, Adelaide, and must have been much pleased with the excellent all-round show of poultry. For the benefit of those who did not attend I will give a few notes on the show, and what may be learnt therefrom. Taken all round, we may consider this the best exhibition of poultry at any show yet promoted by this society. In some classes in former years we have seen individual specimens of greater merit, but this year we see a general elevation of quality in all classes. The prominent characteristic of the whole show was the display of utility breeds, which were in such force that country friends and others were enabled to compare, at any rate, the outward appearances which distinguish the many handsome breeds of utility poultry with those which are merely fancy or ornamental. In passing a group of acquaintances, I was asked what I thought of the show. I answered that it looked as if the course of lectures I delivered four years ago had taken effect; the principal classes in this show are those I advocated. It will be remembered that there are several points which constitute the utility bird. In the case of a laying hen or duck, it is the bird which—while consuming a moderate amount of food—gives the greatest number of decent-sized eggs that is the true economical bird. There are good layers among Brahmas and Cochins; but the amount of food necessary to support the large frame is out of all proportion to the return in eggs; nor do these breeds lays as many eggs as Minorcas and Leghorns. I should be very sorry to see Cochins and Brahmas, Polish, and other birds banished from any of our shows; but it is gratifying to note that the bulk of the exhibits at this show were utility poultry. The laying breeds were well represented by excellent classes of Minorcas and Brown and White Leghorns, amongst which were some very good specimens. These breeds are at the head of the list as layers, are small eaters, and excellent foragers. Every farmer should have at least 200 hens of either breed, divided into four flocks. During seeding-time the birds should be enclosed in wire netting yards, and when the crop is well up they will not hurt it, but, on the contrary, will do an immense amount of good by destroying insects. Those who live at too great a distance from market to profitably engage in rearing poultry for the table should pay special attention to the laying breeds, and these are the two varieties I recommend. I know of a farmer who nets about £90 a year from a flock of 250 head of such birds. I have long advocated the more general practice of keeping poultry on farms and in orchards, not only as a profitable occupation, but also as a means of lessening the insect pests. In many parts, plovers, curlews, wild turkeys, &c., are disappearing, and insects, grasshoppers, &c., soon multiply. Active birds, such as those fowls mentioned, are remarkably keen sighted, and will consume a surprising quantity of insects of all sorts in a day. This food, together with grain, seeds, &c., such as abound on most country runs, makes eggs, and naturally the cost of keep is small. Of one thing we may be certain: if Leghorns and Minorcas of good quality find their way on to a good percentage of South Australian farms our export of eggs, which stood last year at £50,000 worth, will soon be trebled. The Dorking class was fairly strong; silver greys, the more delicate variety, were few in number but of fair quality; the colored variety, recommended as the better for breeding table birds, was well represented; the exhibits of the Boys' Reformatory and Mr. J. J. Gabb were of excellent quality—large size and, in addition, were good show birds. As both these exhibitors own considerable numbers of this variety of Dorking and, further, report that they are hardy and suitable to the climate, we may expect to see them becoming more numerous. The Indian Game classes were well filled, and, although we have seen more good birds at a show, still many of them stood well out. Until I began lecturing Indian Games were practically unknown in South Australia, although it is a fairly old breed, and has been known for decades in the west of England as the Cornish Game; it is only of recent years that it has reached the present stage of perfection and popularity. More than twenty-five years ago there were some in the mining centres on Yorke's Peninsula, but these specimens were not exactly what we see now-a-days. Of all birds for crossing with Dorkings, Langshans, Orpingtons, Wyandottes, &c., for producing table birds the Indian Game is the most valuable. Luckily the bird had not been spoilt by faddists when the present utility movement was started. The wonderful quantity of breast meat carried by this breed, and the power they have of stamping their characteristics on their progeny are of the greatest value. Then they are short legged; the attempt to foster long-legged Indians met with a stern rebuff both from judges and writers. The Malay is too leggy—this is an undesirable point in a table fowl—the thigh is too pronounced and out of all proportion; Malays are also exceedingly quarrelsome. The Old English Game has not yet made its appearance here; when it does it may rival the Indian, as although the cross-bred progeny will be smaller (where the Old English is used) still the quality of flesh and skin will be finer. The ever-favorite Langshan was represented by a good lot of birds. This breed came to stay; it is good for winter laying, is a moderate eater, while crossed with Indian Game the progeny is a fine table bird. The Orpington—comparatively a new breed—has also come to stay, and will soon be booming. This is a good all-round breed, is a good winter layer of tinted eggs, and crossed with the Indian Game gives us a model table bird. The exhibits were only fair. I saw some splendid specimens in Sydney; they were low-set big-bodied birds, yet active, and with a very sprightly look. Many of the specimens at the Adelaide show had too much leg, lacked size, were deficient in breast, and too short in keel. However, several breeders are bent on improving the quality of their stocks, so it will not be long before we shall see this excellent breed well distributed all over the colony. The Orpington is now acknowledged everywhere as a pure breed, and yet it is of composite origin. Minorcas, Langshans and Black Plymouth Rocks are responsible for the bird of the day. Wyandottes, of which three varieties, gold, silver, and white, were on view, show an increase which is satisfactory. This breed is famous for its laying powers, and is further a fair table fowl; crossed with the Indian Game the progeny is excellent, carrying an abundance of well-flavored flesh, which, like the skin, is of a creamy color. Such crossbreds were shipped to London by the Victorian Government, and realised high prices. The pullets are very precocious, and many I know of laid before they were five months old. Ducks were few in number, but were represented by some splendid birds—especially the pair of Rouens shown by Mr. Mellor. The winning Colored Dorkings, Indian Game, and Rouen ducks were from stock brought out by Mr. J. Maude a year or two ago. Indian Runner ducks, most prolific layers, were well represented. I strongly urge farmers to give this variety a trial—they eat very little, but are wonderful foragers. Mr. S. Pitman has a flock, of which nine ducks laid an average of 210 eggs each for the year; these ducks are a little gold mine for eggs alone. They are small, averaging about 4lbs. each, which is the average weight of a common duck, but they mature very rapidly and lay at an early age, and further are excellent for crossing, producing good table birds (with Pekins or Aylesburys); also improving the laying powers of the cross-breds. I noticed some excellent Toulouse and Embden geese of good size; also a few good turkeys. When our producers grow good geese and turkeys they will be surprised at the excellent profits accruing therefrom. A number of agricultural societies have this year kindly asked me to judge, but my official duties do not permit my absence from the office, Of course, it would be most advantageous to have a competent judge at country shows; it is well-known that many of the decisions (and in this city also) are most misleading and incorrect, and it is such judging which does a lot of harm. It is unfortunately the same all over the world. Many English buyers ask the name of the judge (in the case of a prize taken) before they trouble to inspect the birds.

Vermin.

As the warm weather approaches, a careful watch against the inroads of insects must be kept. Sitting hens, if infested, will, as a rule, forsake their eggs. Sometimes the poor birds die on the nest. Apply insect powder to the bird and remake the nest, putting a first course of lime and wood ashes in it. Keep all drinking water well shaded and renew at least once a day. Make ample provision of green food for the summer. Do not overfeed the adult stock, and keep all young birds growing, from the shell onwards. Beware of overcrowding; the young stock will not grow and thrive, and as a rule contract diseases. All roosting houses should be well ventilated, but the birds should not sleep in a draught. Young birds roosting in trees are liable to contract crooked breast-bones, unless perches at least 2½in. broad are fixed in the trees for them to perch upon.

FARM HINTS FOR OCTOBER.

By the Editor.

The best hay is made from cereals cut just when the grain begins to harden. If some tares, vetches, peas, or other legumes have been grown with the crop, and are in blossom or half-filled pods, the hay will be all the more palatable and nutritious. If the plants are left too long before being mown they become woody or fibrous, and lose much of their nutritive value in the form of starch, sugar, oil, gum, and aroma. In our fine, hot, dry climate it is not necessary to leave the hay in windrows and stooks, or cocked, for several days. Get it stacked and thatched as soon as possible. To minimise danger from fire build medium-sized stacks, separated by a sufficient space. Protect each with a fence, and clear a width of a few yards around every stack.

As soon as possible try to secure some well-grown Merino ewes just off the shears to be put, at the proper season, with pure-bred Southdown or Shropshire rams for the purpose of raising lambs for export to Great Britain. Do not be afraid to pay a good heavy price for a pure-bred ram if he is of good quality. The Dorset Horn has been highly spoken of as a sire for this purpose, but at present these are not plentiful enough, and so far the other two have given satisfactory results. Be careful to get only as many sheep as can certainly be kept well fed, and remember that it will be absolutely necessary to provide succulent food for the ewes whilst in lamb and with lambs.

Where legumes have been sown for green manure the crops should be ploughed under now, and after being worked down to a fine tilth the land may at once be sown with a crop of maize or sorghum.

Maize should be sown in rows 3ft. by 18in. at once, in well prepared soil. It is worth while to soak the seed forty-eight hours in weak liquid manure, and put in two seeds at each place. Keep the surface soil constantly loosened up, not deeper than 2in., until the plants are in tassel. Be careful not to cut the roots when hoeing. In rich soils maize can be sown in triple rows, alternately, at a foot apart each way, with 3½ft. between the triple rows. This leaves room for the horse hoe to work between the rows, but the hand hoe must be used between the plants in the rows.

On a portion of the best of the fallow land, of a light, deep, loamy nature, sow some sorghum in drills, and keep it cultivated as long as the horse hoe can be worked. Heavy clay does not suit summer forage crops, and they must be frequently cultivated, else there is but little chance of a good crop.

In the cool hilly parts and in the South-East peas may be sown in drills at 2ft. apart. One and a quarter bushels of seed per acre will be sufficient. There is no better food for fattening pigs than peas, and they can be fed with the haulms from a stack built near to the pens. For sheep they are excellent, and the sheep will gather up nearly every seed from the field when they are turned on to the ripe crop.

Sunflowers will grow upon brackish soils. For large-sized heads sow in rows 3ft. x 2ft, and keep the surface constantly hoed to a depth of 2in. Sown thickly, the plants can be mown for fodder purposes. The seeds are very fattening. One pound per day will give a sleek coat to a horse or cow. Do not feed too much to fowls, but in moderation the seeds are very wholesome.

Silos should now be filled. It is always best to chaff the silage. A mixture of several sorts of nutritious plants is of more value than silage made of one variety only. The crop should be cut during the morning, and put into the silo in the afternoon. That cut in the afternoon should be ensiled next morning. The temperature should have risen in the interim to 130° F. or 140° F., not higher nor lower. When more silage is put on it presses out the air from below, and stops any further fermentation and rise of temperature. The silo should be filled several feet above the top, as the silage will sink about two-thirds of its bulk. When finished cover with some straw, then lay planks on, and put on weight—about 2cwts. for each foot of surface.

If circumstances will permit, directly after the hay crop or silage crop is cut scarify the field to bury seeds and loosen up the surface, so that the rains may sink in. If there should be enough rain it may result in an early bite for the live stock.

Pumpkins and cow melons will give good crops on rich sandy or light loamy soils. It is well to grow a little maize amongst them to prevent the wind blowing the vines about. The slightest twist or turn of the runners will injure the plant more or less. The hills should be 12ft. to 15ft. apart, not more than three plants to each hill, but at least a dozen seeds should be put in each, and if more than six come up remove all but six, and later on remove all but the three strongest. The roots reach as far out as the vines; therefore, in cultivating, do not get too close to the radius covered by the roots.

Always try to have a paddock reserved to allow the grasses to ripen their seeds, first one paddock, and next year another or more. Many of our grasses are annuals, and all are capable of being exterminated if not allowed to seed. Between October and February most of our best grasses and herbs mature their seeds. It would probably pay well to run heavy bushed harrows over the land after the seeds are ripe, to cover them up and protect them against ants, birds, and other destructive influences.

In localities subject to ground frosts it is necessary to defer the sowing of lucern till late in spring—say October. The soil must be deep, rich, and thoroughly well worked and levelled, and certainly not very dry. Ten pounds of seed is enough to drill an acre of land, 1ft. between the drills. Roll when the seed is sown, and when the plants are all up harrow or hoe between the rows. About 1in. is the best depth to sow.

Rape can still be sown in the South-East and hilly parts of the colony; 3lbs. to 4lbs. of seed will suffice to sow an acre; drills should be 18in. apart, plants, 6in. apart, seed ½in. deep, rolled after sowing, then harrowed after the plants are up or, better, horse-hoed.

Sheep-shearing should be undertaken now. Have the shearing shed thoroughly swept and cleared of straw, twigs, &c. Choose a dry day, and do not shear after rain until the sheep are dry. Watch the shearers. See that they shear clean, with no second cuts. Directly each fleece is taken off it should be rolled up and placed on the skirting table, where it is to be opened out and all inferior portions removed and placed separately. Do not tie the fleeces, and be very careful to use only worsted or seaming twine in sewing the bales. On no account use binder twine or twine made of similar fibre.

Plant potatoes in rows 30in. by 12in. and 4in. deep. Use small whole setts about the size of a pullet's egg, or, if cuts are used, cut to about same size; plant eyes downward, pressed into the soft soil. Harrow and roll after planting, and horse hoe when the plants are up. Plenty of old farmyard manure will benefit the crop. English super. 2cwts. and sulphate of potash 3cwts. per acre will be very useful.

INSPECTION OF STOCK.

By C. J. Valentine, Chief Inspector of Stock.

Further examination of cattle in the hundreds of Pirie and Wandearah has resulted in more cases of tuberculosis being discovered. Mr. Deputy Chief Inspector Needham reports four more cases, one, a young cow on which *post mortem* was made, revealed a bad case in both lungs and liver. The owners were instructed to destroy the others. So far all owners have carried out instructions to destroy diseased cows. Specimens from two cows were forwarded for microscopical examination, which confirmed the inspector's diagnosis. Following up his inspection in the neighborhood of Orroroo, Mr. Needham reports dealing with seven more cases of tuberculosis. In two cases milk was being used, and in one instance sold from the diseased animals. Two other slightly diseased animals in prime condition were to be slaughtered and examined. It was necessary in this district to combat a theory held by many of the farmers: that the glandular tumors and wens from which so many of the cattle suffer are caused by grass seeds. It was pointed out that on some of the farms where barley grass was thickest there were no cases of disease.

PAINT AND ITS USES.

The following paper was read by Mr. R. Storr, of Port Broughton Branch, at the Conference of Branches held in April, 1899:—

There are several matters which must be taken into consideration with regard to the use of paint, such as the description of article to be painted, its material, its condition, whether new or old, climatic and other circumstances.

The prime object in painting is the preservative effects of the material used, and as there are great differences in the nature and qualities of paints, it will be necessary to describe them.

White lead is carbonate of lead, and is properly described as "genuine white lead"; but there are inferior pigments called "white lead," which are largely composed of Derbyshire spar, and a still lower quality, which is largely made up of whitening, to say nothing about numerous other substitutes for white lead.

Red lead is an oxide of lead.

Prussian blue is a combination of prussic acid and iron.

Chrome yellow is a combination of chromic acid and lead.

These pigments, consisting more or less of metallic substances, resist the action of the air, light, heat, dryness, and moisture for a longer time than those paints which are principally made up of earthy matters, and are therefore much better to use than the cheaper paints; but if circumstances will not allow of the employment of the best quality, do not fail to use paint of some kind, and by putting on an extra coat they may serve the purpose of those of the better kinds. Venetian red, yellow ochre, and many other pigments come under the latter heading, and will give a waterproof coating of longer or shorter durability.

The painting of all implements, vehicles, &c., should be carried out on all farms as regularly as the tillage of the land or the harvesting of the crops. If farmers would only pay proper attention to the use of paint and the proper shelter of implements, &c., partly or wholly constructed of wood, they would last much longer, and repairs would not so frequently be needed.

The principal cause of tyres coming loose and felloes splitting during the hot weather is that the bare surface of the wood is exposed, and water soaks in during the winter, causing the wood to swell and press hard against the ends of the spokes and tyre. The tyre, too, contracts during the cold weather, and these combined influences cause the felloes to bulge at the tangs of the spokes, and sometimes causes them to split. Let the swelling be ever so little, it will cause the tyre to become loose directly the hot weather causes the felloes to give up the absorbed moisture and shrink, whilst at the same time the tire expands with the heat.

But the above difficulties can be easily prevented by keeping the wood well painted. The oil from the paint is absorbed by the wood, and the paint gives it a water-proof coating, which excludes all dampness.

When the wood is old and bare of paint, the first coat should be very thin, and raw linseed oil used in place of boiled oil, which should be well worked into the wood. Raw oil will penetrate more easily than the thicker boiled oil. For second and third coats use boiled oil, either partly or wholly, as it has more body.

Shelter is as necessary as paint. Some people think they have provided sufficient shelter for their implements, machinery, &c., when they put in a few forked sticks and throw over them a few forkfulls of straw without any protection on the sides. The consequence is that the sun shines on the "sheltered" articles on one side during the morning and on the other during the afternoon, and the wind, rain, heat, and cold alternate all the time in their destructive influences. Every shed should have some sort of walls as well as a roof. Where stone is abundant this will serve best for the purpose; stumps will be found useful in some parts for the present, and will be valuable when firewood becomes scarce in the future; in some places broombush, teatree, &c., can be used with advantage; but in all cases walls of some sort should be provided as well as roofing.

FENUGREEK.—This plant (Trigonella fœnum græcum) is an annual which, under favorable circumstances, produces a heavy weight of stem and foliage, up to 25 tons of green stuff. It is suggested that it can be used as a green manure. It is used for flavoring hay, and the seeds have an aromatic quality, and have a special value in veterinary medicine.

REPORT ON THE MELBOURNE INTERCOLONIAL PHYLLOXERA CONFERENCE.

Sir—In accordance with your instructions, we attended the Intercolonial Phylloxera Conference held in Melbourne from the 1st of August to the 8th of September, and now have the honor to submit for your consideration our joint report on the subject:—

The matters that came under discussion may be briefly summarised as follows:—

(*a*) Inspection of Vineyards, with a View of Checking the Spread of the Disease.
(*b*) Treatment of Centres of Infection. Extinction System.
(*c*) Consideration of so-called Curative Methods.
(*d*) Reconstruction of Vineyards on American Resistant Stocks.
(*e*) Importation of Vines or Portions of Vines. Disinfection.
(*f*) Legal Measures Relating to the Pest.
(*g*) Value of Native Vines as Resistant Stocks.
(*h*) Local Biology of the Phylloxera.

Inspection of Vineyards.

From the very outset members of the Conference were called upon to decide betwixt two different methods of inspection: one as practised in Victoria, and consisting in a rapid and cursory examination of the vineyards, a healthy appearance of growth being always taken as a guarantee of immunity; the other, as latterly adopted in the Cumberland and Camden districts of New South Wales, and consisting in a close and systematic root examination of a definite percentage of vines (one vine in four, in six, in seven, in ten, &c., according to the greater or lesser propinquity of centres of infection). It was maintained by some of the New South Wales delegates, and more particularly by Signor Blunno, who, as we understand, is mainly responsible for the adoption of this method in that colony, that by no other method could the pest be discovered in the early stages of its appearance in any given district. From the evidence tendered, however, it was soon very evident that in view of the enormous expense it entailed, a close root examination of extensive unaffected areas was altogether out of the question. It appeared to be the general opinion of the Conference that, whilst such an intense system of inspection might be very necessary within the immediate neighborhood of centres of infection, what was not inappropriately termed the "flying system of inspection" was all that could be recommended for unaffected areas; and with these general views of the Conference on the subject we are both in perfect accord.

In this connection the disproportionality that exists betwixt the Victorian inspecting staff and the area under vines in that colony was freely commented upon. It appears to be more than probable that, together with other matters to be referred to in the sequel, this inadequacy of inspection is very largely responsible for the recent rapid spread of the pest. Subsequently to some discussion on the subject, it came as a recommendation from the Conference that it was imperative that the number of the Victorian phylloxera inspectors be brought more in line with the number of acres under their supervision.

In view of the fact that our vineyards have never been submitted to a systematic inspection, the immunity of South Australia from the pest was more or less openly questioned. We are personally very strongly of opinion that the pest has not yet invaded our vineyards; for had it been introduced here not longer than two years back, its presence would already be revealed by the gradual dying out of vines around the infested spots in numbers sufficiently great to attract public attention. Nevertheless, both with a view of facilitating the circulation in other colonies of all our vegetable and plant produce, as proceeding from a colony certified on inspection to be absolutely free from the phylloxera, and with a view of detecting the pest in the very earliest stages of its appearance, should it ever in the future appear in our midst, we strongly recommend that our vineyard area be thoroughly and regularly inspected. We understand that you have already been approached on the subject by a committee of the S.A. Vinegrowers' Association, and we venture to express the hope that the Government will see its way to acceding to their request.

Treatment of Centres of Infection.—Extinction System.

Under this heading much discussion took place that must prove of vital interest to South Australian growers; we therefore make no apology for devoting some space and time to its consideration. And here, in recognition of the fact that this question appears, unfortunately, to have become the favorite theme of discussion of many self-constituted instructors of the public in general and of vinegrowers in particular, and that their contributions tend frequently to confuse the points at issue, we may be allowed a short digression on the subject. In spite of what may have been said to the contrary, either here or in the neighbouring colonies, it is the definite opinion of all those on whom any reliance may be placed in the matter that the treatment of the pest in newly-invaded countries or districts must differ radically from that finally adopted in countries such as France, Italy, &c., whose territory has gradually become all but completely contaminated. In the latter, any further fight against the insect is practically thrown up, and resistant American stock, to which reference will be made in the sequel, is of necessity fallen back upon. In the former every effort is concentrated in attempts at stamping out the disease and confining it to the original areas of infection; this is what is known as the "extinction system or process." When this method was first resorted to in Switzerland, hopes of ultimately completely extinguishing the pest were very probably entertained; it cannot be said that thus far such hopes have in any way been realised, excepting, perhaps, in the Prussian Rhine provinces. Nevertheless, it must be recognised that originally such methods as may have been adopted had not attained to the advanced state of perfection in which they have been bequeathed to us by the experience and misfortunes of earlier infested countries. But in spite of the defects of these earlier methods, who can deny that they have rendered splendid service to the wine-growing industries of those countries which were fortunate enough to resort to them at an early enough period. This is what Monsieur Valery-Mayet, a distinguished French entomologist, writing in 1890, says on the subject. After recognising that the extinction system has not hitherto succeeded in completely eradicating the pest, he adds:—"It is nevertheless true that Switzerland, though invaded nearly twenty years back, has, by a yearly expenditure of from £2,000 to £2,400, that is to say a sum representing the interest on little more than £40,000, has succeeded in protecting, and will continue to protect for many years to come, vested interests representing a capital of more than £40,000,000." Again, we may refer to the experience of Algeria, a country in which this system has been applied with a fair amount of success. In spite of the presence of the phylloxera in the midst of its vineyards, the area under vines has in the last fifteen years risen from 200,000 acres to 375,000 acres; surely this is indicative of a considerable amount of success in holding the pest at bay. Monsieur Pierre Viala, Professor at the Paris Agronomical Institute, and one of the highest living viticultural authorities, whilst on a recent (March, 1899) official visit to Algeria, strongly recommended growers to adhere as long as possible to the extinction system that had given such good results, and to only fall back on

American stock in very last resort. But have we not nearer home very good examples of the effectiveness of this extinction system, even when very slackly applied? New South Wales, though invaded by the pest some sixteen years ago, has up to date lost only about 100 acres; Victoria has probably lost about 2,000 acres in twenty-two years. Compare now with these cases what occurred in France, invaded in the early days, when neither the pest nor extinction systems were understood or even known; here the pest is first discovered in 1868, and in 1885, that is to say, seventeen years later, 3,000,000 acres had been completely destroyed—about one-half of the French vineyards. We may take it therefore for granted that in spite of the clamor of some few more or less well informed persons, in the interests of those who have sunk a considerable amount of capital in their vineyards, it is of utmost importance that the pest be confined as long as possible to restricted areas by the adoption of a strictly applied extinction system.

The comparative inefficacy of the early attempts at an extinction system has already received casual allusion. The system which in later years has been attended by a great measure of success has gradually crystallised out of the many failures of the past. It will be unnecessary to follow out the various steps that have led to what is now finally recognised as the only effective system. It is sufficient to state that all other methods of treatment have practically been discarded for that by carbon bisulphide in suitable quantities. This chemical compound is injected into the soil, where its vapors spread and destroy, not only the insects and their ova, but also the vine roots on which they prey. To avoid the early escape of the vapors before the completion of their allotted task it is necessary that it should be applied before the soil is broken up or the vines uprooted. It is injected into the soil to depths varying from 12in. to 16in., and at distances of 18in. to 20in. quincunx throughout the infested area; and, further, a similar treatment should be given over a distance of at least twenty vines beyond the last infested plants. The treatment should include three different applications; the first at the rate of 8ozs. to 9ozs. to the square yard; the second and third, at fortnightly intervals, 4ozs. to 5ozs. to the square yard. In addition to the above treatment, as a measure of precaution, for four or five succeeding years the neighboring vines should receive regular cultural treatments with carbon bisulphide in such quantities as not to permanently injure the vines. These latter treatments can readily be given at very little cost with sulphuring ploughs.

It is evident, however, that the whole success of the treatment is largely dependent on the strictness with which the infested spots are quarantined. Persons travelling over them should always be carefully disinfected before leaving them; in fact only those immediately concerned in the treatment should be allowed access to them. Neither farm implements nor vehicles of any sort should on any account be allowed to cross over the infested spots; spades, picks, injectors, &c., called into use in the treatment should always be thoroughly cleansed before being removed.

We have digressed at some length from the doings of the Conference, but in order to avoid lengthy explanations in the course of the narrative, it was necessary to do so. The Conference was enabled, after occasional difficulties in some cases, to get a definite account of what had been done both in New South Wales and Victoria towards stamping out the pest. With the evidence before them, the members of the Conference could come to but one conclusion, namely, that neither in Victoria nor in New South Wales had the extinction system had a fair trial; and that in consequence any condemnation of the system on the grounds of local experience was altogether premature. A resolution was passed to that effect. It would appear, however, that during the course of the last year the real extinction system has been energetically put into action in New South Wales by Signor Blunno. It is too early yet to pronounce on the results achieved, but it may be noted that the work has been undertaken under some difficulties, as the pest has been known to exist in the colony for the last sixteen years. The Conference was further able to gather that whilst in New South Wales the pest had been confined to one district—that of Camden and Cumberland—in Victoria it had spread from Geelong to Bendigo in 1893, to Heathcote in 1895, to Ardmona and Toolamba in 1898, and to Rutherglen in 1899. Judging from what evidence we were able to gather on the subject, this extraordinary spread of the disease over widely-separated districts is due, first, to the non-application of a really effective extinction system, and, secondly, to insufficient quarantining of the infested districts.

It hardly came within the province of the Conference to animadvert on those concerned in the extirpation of the pest in one or the other of the infested colonies; it could only seek to obtain evidence as to what had or what had not been done in the matter. And in commenting on the evidence we are very far from desiring to throw blame on anybody; we merely wish to point out what has taken place for the guidance of our growers, should they ever be placed in a similar predicament. We readily recognise that in 1877, when the pest first appeared in the Geelong district, the world was not well in possession of that knowledge that enables us nowadays to meet the foe with some chance of success; but how regrettable that in later days the experience of other countries had not been put to better account. At Geelong the treatment of the pest was heroic, if somewhat primitive, and, we are much afraid, wholly inadequate. At first the vines were simply grubbed up, and the holes filled with salt; the ground was subsequently ploughed to a depth of 12in., and what roots could be traced were removed. The inadequacy of this treatment became apparent in later years. Seven or eight years later, it is said, roots covered with phylloxeras were still to be discovered in the treated patches. Deeper trenching was then resorted to (18in. to 20in.), and carbon bisulphide was called into requisition, and applied, as we were given to understand, in a plough furrow. And finally it was heroically decided to uproot every vine within a twenty-mile radius of the infested spots; and in spite of that the phylloxera was not stamped out. And here the well-known fable of severed vine roots maintaining their vitality for a period of ten years in phylloxera-infested soil without, however, during the whole of that same period emitting either leaf or shoot growth, was again revived. This fact is so much in opposition to all that we know about the behaviour of other plants that we are unable to accept it without more conclusive proof. In this connection it might well be asked, if during all this time the insects are unable to destroy solitary roots, of what possible danger can they be to normal healthy vines in full possession of all their vegetative organs? The explanation of this extraordinary occurrence is probably to be found in the following fact, which we give on the authority of Mr. H. Tryon, Government Entomologist for Queensland, who appeared to us to be better informed on the local history of the phylloxera question than anybody else we were privileged to meet. According to him, and he bases his statements on printed reports, even after the infested plots had been put under grass, men had to be employed in hoeing up shoots springing from imperfectly grubbed up plants. Under the circumstances we can well understand that live roots should have been discovered even seven or eight years after the original vines were supposed to have been completely taken up.

With regard to the more recent outbreaks of the pest at Bendigo, Heathcote, etc., the phylloxera inspector, Mr. Hopton, appears to think that they were due to re-importation of the disease from foreign sources. This, considering that up to that period the importation of vines into Victoria had been strictly prohibited, we, in common with most other members of the Conference, think extremely unlikely. It cannot be denied that the phylloxera had never been thoroughly eradicated from the Geelong district; in fact in later years vines were allowed to be replanted in the originally infested districts, at the risk of the owners, and were subsequently found to have contracted the disease. All evidence would, in our opinion, tend to show that the disease has spread all over Victoria from the Geelong district. At Bendigo, as we indicated above, the pest was first discovered in 1893; here, again, heroic but altogether incomplete measures appear to have been the order of the day. Vines were to be uprooted within a three-mile radius of the infested spots; it was, however, subsequently reduced to two miles. Carbon bisulphide was used here, but not, according to us, in such a manner as to ensure the success of the treatment. We were unable to find out what were the exact quantities used, but from what we could gather they were certainly below those recommended by the best European authorities. Instead of completely saturating the soil throughout with vapors of the liquid by injections at regular and close intervals, the liquid was simply applied in two holes on either side and in the immediate neighborhood of the stems of the plants. We have it on the authority of Mr. Hopton, that even by this imperfect treatment the vines were killed down to 6ft. below the surface of the soil; but we would like to point out that such a treatment, however perfectly it may ensure the destruction of the vines, can hardly be recommended when it is the destruction of the parasites that is the primary object in view. The deadly vapors can hardly be expected to diffuse through the soil from one or two injection holes distanced 6ft. to 8ft. one from the other, and consequently only a relatively small number of the insects would come under their destructive influence. True, the remainder would gradually be killed out by starvation, if, as is said by Mr. Hopton, such a treatment ensures the complete destruction of the root system; but meanwhile may not some few accidentally migrate, and occasionally create new centres of infection? The probabilities of such an occurence are considerably increased when, as we have again to recognise, quarantine regulations were not sufficiently strictly enforced. We have it on the authority of Mr. Hopton that even Mildura imported fruit trees from the phylloxera-infested centre, Camden, New South Wales. This fact it behoves us to carry well in mind, in view of the ever-recurring requests of Mildura settlers to be allowed to introduce fruit and plants into our unaffected areas.

With the extension of the dread disease to Ardmona and Toolamba in 1898, heroic measures were dropped; vines were only taken up within the immediate vicinity of centres of infection, but otherwise it did not appear to us that any more effective treatment had been adopted to keep the invader in check. The evidence being of somewhat contradictory nature, we were unable to ascertain what had exactly been the measures used here. Apparently both carbon bisulphide and kerosene had been called into requisition, but in wholly insufficient quantities. Kerosene is very far from being a highly volatile liquid, and its efficacy as a remedy cannot possibly be traced to the toxic action of its vapors. By immediate contact alone can it act, and consequently to be of any real value it would require to be used in such quantities as to practically flood the soil. This can hardly have been the case here, when, as we were given to understand, not more than two to three cases to the acre were used. Again, from the evidence of a local grower, we have to note apparent neglect of strict quarantine.

And, lastly, the phylloxera is discovered in 1899 by Mr. C. French, in the Rutherglen district, the largest and most important vine-growing district in the colonies. It is as yet apparently confined to a relatively small area; but unless more effective measures be rapidly taken to check its advance than have hitherto prevailed, it will not be long ere the whole area comes under the destroying influence of the pest. Here carbon bisulphide was again applied in much the same inefficient way as at Bendigo, and in wholly insufficient quantities ; 18 grams per vine, we were given to understand, that is to say a little over ½oz. It is, however, only fair to recognise that in treating this patch the department was laboring under considerable difficulties ; the discovery of the pest came in the heart of the wet season, and the soil saturated with moisture could not lend itself to the proper diffusion of the vapors This fact, to a certain extent, would tend to explain the apparent failure which we notice referred to in a letter to the Melbourne *Argus*, under date of September 8th ; it is there stated that the treated vines are budding with the return of the warm weather. We are, however, certain that the paucity of the liquid used would only tend to accentuate the failure.

Such, then, is the history of the disease in Victoria, as elicited from evidence given before the Conference. Under the circumstances, can it be denied that the Conference was perfectly justified in passing, with the concurrence of the New South Wales representatives, a resolution to the effect that the extinction system, properly so understood, had not yet had a fair trial in Australia.

Consideration of So-called Curative Methods.

These so-called curative methods are methods of treatment adopted in ultimate resort by those countries in which the pest has spread to such an extent that extinction systems must of necessity be abandoned. At some considerable cost, it is true, they enable phylloxera-infested vines to struggle on for a few years longer, whilst the owner has time to build up a new vineyard on resistant stocks. Of such are treatments with moderate doses of carbon bisulphide, with potassium sulpho-carbonate, and submersion or flooding in winter. At one time some of these methods of treatment were very extensively used in France, where the pest had contaminated enormous areas of country before any effective remedy could be devised, and where in consequence extinction systems were practically never used (excepting very lately in the Champagne district). Even to the present day they are still to a minor degree in use in some few vineyards. It has, however, long been proved that they could only serve to ward off for a short while the evil day of the complete destruction of the vines ; they prolong the life of old vines for a few years, that is all that can be said for them. On this matter the Conference, without much discussion, passed a resolution to the effect that, seeing that the policy of the Australian Governments had hitherto had for its object the stamping out of the disease, it could not countenance any of these so-called curative systems. Such a resolution was very naturally supported by us.

Reconstruction of Vineyards on American Resistant Stock.

The Conference then passed on to the consideration of a question of considerable importance, viz., the advisability of immediately proceeding to the reconstruction of the vineyards of the phylloxera-infested colonies on American resistant stock. To us it was evident from the beginning that the majority of the delegates were longingly looking to this course as offering an easy issue out of the present difficult state of affairs. In this position they were well backed up by the sneering references of the Victorian press. And further witnesses were called, and their evidence (if such it may be called) all went in favor of a scheme that in our opinion would considerably endanger existing interests. In order to bring matters to a head, and save useless opposition to the measure, a Victorian grower, Mr. Craike, moved, " That in the opinion of this Conference the time has now arrived for the reconstruction of the vineyards of New South Wales and Victoria in the phylloxera-infested districts with American resistant vines." This motion at first appeared to have the almost unanimous approval of those present; alone with Mr. H. Tryon, of Queensland, we felt it our duty to strongly oppose it. In the end we had the satisfaction of gaining by our arguments at least the neutrality of some of the delegates. The arguments of all the advocates of American vines, delegates, witnesses, and press included, resolved themselves simply to the fact that, such a practice having been adopted in France and other European vine-growing countries, we could not do better than follow suit. We regret that we personally are unable to take much account of the evidence on this question furnished by the witnesses examined by the Conference. None, so far as we were able to see, had any personal experience of the remedy they so warmly advocated; none could advance anything more than more or less questionable opinions founded on hearsay, and all seemed utterly oblivious or indifferent to the dangers it brought in its train. Some, it appeared to us, pushed the advocacy of this panacea to an absurdly extreme limit; they would, said they, uproot their existing vines, whether diseased or not, whether in a clean or phylloxera-infested district, and gradually replant them on American roots. Whether American vines are to be adopted in Victoria or not, we cannot believe that such an extravagant opinion will ever be indorsed by the majority of Victorian growers. We were also told by a delegate of one of the clean colonies that it was a matter of regret to him that in his colony vinegrowers had not from the beginning planted their vines on American resistant stock.

This motion, which was eventually carried by a majority of three, we opposed to the best of our ability. The Victorian press, having from the beginning prejudged the question at issue, gave at great length all evidence that went towards supporting it; we, on the other hand, who represented the other side of the question, received but scanty notice We therefore take the opportunity of giving in detail our arguments, amplifying them even where necessary, in the belief that a clear statement of our attitude is due to the vinegrowers of this colony.

Our opposition was first grounded on the fact that any abandonment of the policy of extinction on the part of the diseased colonies would considerably endanger the safety of the vineyards of the as yet unaffected colonies—Queensland, Western Australia, and South Australia. All the colonies, as we understand, contributed in pecuniary form towards the first attempts at extinction in the Geelong district. These attempts were unsuccessful; we have already shown why. Could we subscribe to a policy that admitted of the free propagation of the pest on our very borders on the eve of general federation, when, presumably, the difficulty of watching these same borders will be considerably increased? But we can conscientiously add, in spite of the fact that the mover subsequently attempted to make capital out of this statement, that our opposition was very far from being based on purely parochial reasons. We can assert that we felt obliged to oppose the motion in the interests of those growers, both in Victoria and New South Wales, whose vineyards are as yet unaffected by the disease, and whose incomes would be seriously threatened by the adoption of such a policy.

We pointed out that, granted certain premises, this reconstruction on American vines was not so much a question to be settled by a conference of experts as by the consensus of opinion of all those more immediately concerned. Growers were but sparsely represented on the Conference, and even all those present could not take upon themselves to voice the opinions of the thousands whose pockets would be seriously affected by the adoption of such a measure. We did not question the resistance of some of the best American stock, nor the likelihood of their probable adaptability to our climates and soils; in fact, these points we take to be almost beyond dispute, both from results obtained in Europe within the last twenty years and from some experiments conducted under Australian conditions, of which we are cognisant. Effectively it was these points together with the recognised possibility of keeping the pest within bounds by a judicious application of the extinction system, that we referred to as being postulated in our argument. These, we maintained, were the limits beyond which, in the presence of strong divergence of opinion, a conference practically composed of professional experts should not go. As to whether it was as yet advisable to fall back on these American vines or not should, we thought, be left to the decision of the majority of those who would be affected thereby, and, we hasten to add, it is to the instructed vote of the growers that we look, to the vote of those acting with their eyes well open to the dangers they would be incurring, and not to those voting blindly according to the loudest prompter. In such a matter, we take it, the State should be bound by the decision of the growers. We can conceive of but one case in which it would be justified in overriding a strongly expressed opinion. If it could be proved that by their action a small section of the community were hindering a large majority from taking advantage of a profitable industry, then alone, we think, would the State be justified in shaping its policy in the interests of the outside majority. Admitting, for the sake of argument, a grower's vote adverse to the introduction of American vines, it could hardly be claimed as hindering the expansion of the industry in the colonies. Without the aid of these resistant stocks, and in the teeth of the pest, has not the area under vines in Victoria within the last twenty years expanded from some 4,000 acres to over 30,000? Have we not, under identical conditions, a further example in Algeria, the area expanding in sixteen years from 200,000 acres to 375,000 acres?

We then proceeded to point out what in our opinion would be the dangers attending on the introduction of these stocks, and the sacrifices to which they would expose existing growers. We pointed out that the replanting of infested areas on resistant stocks would very considerably hasten the contamination of the as yet clean areas. The unsatisfactory manner in which the quarantine regulations had been carried out in the past, when attempts were concentrated in stamping out the pest, and no vines allowed to be replanted in infested spots for a specified period of years, had already come under the notice of the Conference. If difficult in the past, how much more difficult would it become in the near future, should the pest be allowed to breed freely on resistant stocks in the infested areas? And, further, it must be noted that in addition to increased facility for accidental contamination by human means, the natural methods of spreading of the pest would also be considerably increased. The winged form would come to maturity unhindered, and be carried by the slightest breeze over considerable distances. The gall form, at present unknown here owing to the unsuitability of European vine leaves to the formation of galls, would develop wherever American leaves were to be found; and these, given large areas under American roots, should be fairly numerous in nurseries and elsewhere. This danger from the possible development of the gall form should not be underrated; in fact, to its present non-existence in Australia should probably be attributed to a certain extent the relatively slow spread of the disease that we know of. It has been well named by Mr. Valery-Mayet, to whom we have already referred, the multiplying form *par excellence*. One solitary gall phylloxera will in the course of a season deposit from 500 to 600 ova, each one of which yields an individual capable of doing nearly likewise; and of such there are six or seven generations in a single year! So that, were there no loss of life, a single insect might in the course of a season be the starting point of more than 16,000,000,000,000,000 gall insects! But the gall insects are not only a source of danger as giving rise to an inexhaustible supply of devastating root forms; they live on the leaves, and as has been proved long since by the experiments of Mr. Faucon, are from thence liable to be carried by strong winds to neighboring vineyards as yet free from the pest. We felt, therefore, well justified in urging that the general introduction of American vines into the affected colonies would hasten the spread of the disease over their unaffected areas— first, on account of increased quarantine difficulties; and second, on account of the inevitable appearance of gall forms of the insect.

Now what is the importance of the interests that are threatened by such a policy? This is the question that next occupied our attention. Victoria has some 30,000 acres under vines, representing, at a low estimate, about £1,000,000 sunk in the soil; could such interests be wholly abandoned? To bring an equal area to the same stage of fruitfulness would involve growers in the expenditure of an even greater amount, as we shall endeavor to prove in the sequel; and further, would come the loss of several years' crops, betwixt the uprooting of the vines and the period of full bearing, say on an average six years, which we are persuaded will in all probability be exceeded in actual practice, and representing to the colony an additional loss of another million sterling. The position to be faced therefore may be summed up as follows :—Complete loss of £2,000,000, and the probable expenditure of £1,500,000 to bring the new vines into bearing. We very much question whether the majority of growers would be prepared to agree to such a position.

We intimated at an earlier stage that reconstruction on American vines implied a considerable swelling of the capital account; we further add here that the annual cost of cultivation, &c., would also be considerably increased. In making such statements we were not, as has been suggested in some quarters, merely giving expression to a more or less fallible personal opinion, but simply and naturally inferring that what had occurred in other countries would under similar conditions occur here. As our mere affirmation of the matter has been very much questioned, it may be as well to show that our contention is supported by reliable authorities. The General Viticultural Congress, held at Montpellier in 1893, appointed a select committee to inquire into the general results of the reconstruction on American vines. In their report—drawn up by Mr. Henri Marres, one of the most respected growers of the Herault (south of France)—we find that the cost of bringing a vineyard to its fourth leafage had been raised from £21 to £32 per acre; that the yearly cost of cultivation had risen from £6 to over £11 per acre. Here is a literal translation of an excerpt of the report :—" Our working expenses have generally doubled, and our yields have up to the present moment shown a tendency towards decreasing rather than increasing. These working expenses often reach 800 francs per hectare and more (*i.e.*, £12 4s. per acre and more.)" The report goes further on to state that it is questionable whether these grafted vines will yield much more than twenty-five good crops, as against fifty and 100 of the old European vines. Consequently bigger initial expenditure, to be recovered within a shorter space of time. And far more recently, in March last, have we not Mr. Pierre Viala warning Algerian growers that though from American vines they may possibly obtain heavier crops, their general expenses will be considerably increased by the use of them.

We then proceeded to point out the danger incurred of accidentally importing from America or Europe on imported vine cuttings some of those dread vine diseases of which up to the present time we appear to be free. We refer to downy mildew (Plasmopara viticola), black rot (Guignardia Bidwelli), and white rot (Coniotherium diplodiella). This matter had been previously dealt with in a very able manner by Mr. D. McAlpine, the Victorian vegetable pathologist, and was now well supported and supplemented by Messrs. H. Tryon (Queensland) and C. French (Victoria). It was pointed out that though spores adhering to the cuttings might possibly be destroyed by immersion in strong solutions of copper sulphate, some portion of these fungi were always liable to be found embedded in a dormant state within the tissues of the cuttings, and consequently completely beyond the reach of any fungicide. These diseases must not be looked upon as more or less harmless bogeys called up in support of our argument; they must be looked upon as diseases of exceptional importance, and liable at any time to be imported into Australia on vine cuttings. In its destructive nature and suddenness of development, mildew may be compared to red rust in wheat. Within a fortnight every leaf in a vineyard may be invaded, falling shortly afterwards, and leaving the fruit exposed to the tender mercies of the sun. The fruit also is liable to direct attack. Black rot is disastrous only on the fruit, which it almost completely destroys. The same may be said of white rot, which, however, is by no means so destructive. In order to keep these diseases in check, costly treatments have to be adopted; and for black rot none really effective has yet been hit upon. These are some of the disastrous inconveniences we shall expose ourselves to by importing cuttings from Europe or America.

Finally, we recognised the existence throughout Victoria of a more or less inarticulate cry in favor of the introduction of American vines; but it was a mistaken cry, much fostered by the local press, a cry that had arisen in consequence of the evident failure of a more or less loosely applied extinction system. Let Victoria, we urged in conclusion, give the rational and approved extinction system a fair trial in the Rutherglen district, and if within a couple of years it is found impossible to restrain the pest within bounds, well then there will be nothing for it but American vines.

In spite, however, of our opposition, the resolution in favor of the immediate reconstitution of infested vineyards upon American resistant stock was finally adopted by a seven to four vote, many abstaining from expressing a definite opinion on the subject: a silent, if ineffectual, tribute to the justice of our arguments. Reviewing our position more at leisure, we can see no reason for regretting the stand we felt impelled to take; and we still maintain that neither in New South Wales nor in Victoria should American vines be definitely adopted without the emphatically expressed assent of all those immediately concerned. We have no illusions as to the nature of the answer that would be returned were it sought at the present moment; neither have we any as to the nature of the blessings that will in the future be invoked on the heads of those who by their actions and ill-considered advocacy would have been mainly responsible for it. In our opinion, growers should not be asked to decide in the matter before having laid before them in an impartial manner the risks and sacrifices to which an assent would expose them. Notwithstanding statements somewhat unfairly made by the press, to the effect that nobody present at the Conference had any practical knowledge of the reconstruction on American vines, one of us has had a sufficient amount of European experience of them to be aware that many who talk so glibly on the subject, are blissfully unconscious of the pitfalls that surround them. We are, therefore, able to add both from *personal* experience and a full knowledge of what has occured in Europe, that though American vines will yield perfectly resistant stocks, and in suitable soils satisfactory growth, they will at the same time involve a perfect revolution in our generally rather careless and inexpensive methods of vine-growing, besides, in all probability, considerably raising the cost of production. The grafted vines have always proved far more delicate and susceptible to the effects of off-hand careless treatment of disease and of general meteorological accidents. They imperatively call for far more thorough and perfect tillage than usually prevails in Australian vineyards, and we very much fear that like in France the yearly application of manures in heavy dressings will have to follow on their introduction. What other objections may be raised to them, and to what dangers they will expose us, have already been dwelt upon; it will be unnecessary to repeat them here. We may be allowed to point out that the adoption by Victoria at the present moment of these resistant stocks would be tantamount to a confession on her part of inability to put into action a rational extinction system. Judging simply from the evidence that came before us, this, given the requisite willingness, should not be the case. If, however, the disease has in reality spread further than we were actually made aware of, it is possible that the time for radical treatments may unfortunately have been allowed to slip away, in which case growers could not but vote for American vines. We would, however, strongly deprecate their use in any but diseased districts, which should further, in the interests of the clean parts of the colony, be subjected to the strictest of quarantines, far stricter than has hitherto prevailed. As for New South Wales, where we are given to understand that the disease has been confined to a single isolated district, and where it appears an excellent and thorough, extinction system has lately been put into force, we fail to see any reason for the present adoption of resistant stocks. We trust, in the interests of growers, that it may take many years before it may be found necessary to resort to them.

The advisability of the introduction of American vines having been affirmed by a small majority, the Conference next passed a resolution in favor of the establishment of central and district nurseries under Government supervision in the diseased colonies. On this motion we did not vote, though given the introduction of the stock as an accomplished fact, we would in the main agree with its provisions. We hold that, in order to avoid many mistakes and considerable disappointment, the distribution and use of these American vines should always take place under official expert supervision.

This question of American vines was not probed to any further details, it being naturally judged that the details of arrangement of subsequent procedure should be left to each separate Government, acting under advice of competent experts.

Importations of Vines or Portions of Vines. Disinfection.

The introduction of resistant stocks brought up the question of the danger we would be incurring from the possible simultaneous introduction of other serious diseases. Mr. D. McAlpine very ably showed the impossibility of absolutely guaranteeing the absence of traces of dangerous fungus parasites on cuttings, even after the most approved treatments; the danger lurked in dormant portions of the mycelium and resting spores more or less deeply embedded in the tissues of the plant, and consequently beyond the reach of all fungicides. Against external portions of the parasites, spores, &c , he recommended immersion in a 10 per cent. solution of ferrous sulphate. Personally we feel inclined to question the efficacy of such a treatment, more particularly against the various hardy forms of resting spores common to most fungi; we would much prefer an immersion in a copper sulphate solution, a far more powerful fungicide.

At a later period a somewhat vague and useless resolution was adopted to the effect that, in order to guard against the further introduction of phylloxera and other dangerous fungus diseases, vine cuttings, from whatever source imported, on their introduction into any of the colonies, should be dipped as well as fumigated. But dipped in what? And has it not been very clearly shown that no dip on earth can thoroughly cleanse cuttings from infection of parasitic fungi. Such cuttings, the resolution valiantly adds, should be grown for at least a twelvemonth in quarantine, and suitably treated should any disease put in an appearance. Grammercy for such a consideration, and of what possible advantage would such a treatment be to the community in general, given that one of these rapidly spreading diseases had been allowed to obtain a footing in however small a corner of our territory. We know of no treatment against any fungus disease that will do more than will enable the plants to withstand the effects of the attack. Once introduced it will never be eradicated. Far better burn every individual of them is our opinion. If American vines are to be introduced into phylloxera-infested colonies, well and good; let such colonies take attending risks on their own devoted heads. But having, as is undeniably the case here on Australian soil, and consequently free from any dangerous disease excepting phylloxera, practically every variety that winemakers, raisin-growers, table grape growers can possibly require, we take it to be an egregious piece of folly for clean colonies, such as South Australia, Queensland, and Western Australia, to import further vines from foreign parts.

It has duly been recognised that the quarantining of infested districts has hitherto been somewhat loose. How otherwise account for the recent rapid spread of the disease in Victoria? Clean Mildura importing fruit trees from phylloxera-infested nurseries, says Mr. Hopton! In the interests of the whole colony some measure of strict quarantine is absolutely necessary, but the interests of one industry should not unfairly hinder general internal trade. Consequently it was resolved at this stage of the proceedings that rooted plants other than vines, proceeding from phylloxera-infested districts, should, before leaving them, be officially fumigated. and, further, be accompanied by an official document certifying that they had not been grown within 100yds. of vines. But, continued the resolution, the removal from such districts of rooted vines or vine cuttings should be absolutely prohibited. With all which we heartily agree.

In connection with these matters a side issue of some importance came under discussion. It would appear that the recent importation by New South Wales and Victoria of 250,000 American vine cuttings resulted in a comparative failure, some very limited percentage alone having survived. In contrast to the first attempt, a later importation of 50,000 was a marked success. The difference in the results is attributed by Signor Blunno to the times of the year at which the respective importations took place. The first importation—the one that failed—reached our shores, we understand, in the month of February; the second in the beginning of April. Signor Blunno concludes therefrom that cuttings should be introduced as late as possible. This does not appear to us the best solution of the difficulty; in fact we question whether very early cuttings would not after all prove more satisfactory. Cuttings cut in Europe in November would reach us towards the end of the year, and could, we believe, by the aid of care and artificial irrigation, be made to strike in a satisfactory manner, and ripen their wood sufficiently before the arrival of the cold weather.

Legal Measures Relating to the Pest.

The somewhat utopian idea of bringing all the colonies under a uniform Vine Diseases Act was entertained by a few. It had, however, to be recognised at an early stage of the proceedings that such an idea could not be brought within the realm of practicalities; interests were too conflicting, general conditions too different. A sort of compromise was effected by Mr. Preedy, of New South Wales, by obtaining the sanction of the Conference to a resolution purporting to give a general outline of the policy that should be pursued in the treatment of the phylloxera disease in its various stages of development. As we felt that we could agree with its main features and objects, we gave it our support; to some of its details we are obliged, however, to take exception. Here is the motion *in extenso*—"That in the opinion of this Conference Phylloxera Acts should in clean colonies provide for the drastic eradication of the disease, and that reasonable compensation should be paid for vineyards destroyed in the administration of the Acts; that in diseased colonies the above should be provided for in clean districts alone. When, however, the disease is firmly established in a colony, legislation should provide for keeping the pest in check as long as possible by the most approved methods, pending replanting with resistant stocks." Now, why should compensation cease in a diseased district if eradication and uprooting is to continue? And if clean districts alone are to receive compensation, how are the limits between the two to be established? In our opinion, so long as any damage whatsoever is done by the community, or in its name, to a single individual, that damage should in strict equity be made good to him by those in whose interests it has been done. It is on such a principle that compensation is provided for in the new South Australian Phylloxera Act, and we are at a loss to imagine a more equitable arrangement. We would further have liked to have seen the proper moment for the introduction of resistant stocks more strictly and minutely defined, We would have preferred the end of the motion to have read—"That when it has been recognised by the majority of the growers of the diseased colony that the progress of the pest could no longer be checked by a rigorous application of the extinction system, measures should be taken for the replanting on resistant stocks." In the main, however, we were glad that such a motion should have emanated from one of the diseased colonies, and supported it accordingly.

Value of Native Vines as Resistant Stocks.

Very little discussion took place under this heading; nor could it be otherwise, as, so far as we could see, nothing of practical importance has ever been done in the matter. The late Baron von Mueller, Mr. C. French informed us, had, after various trials, given up the idea as chimerical. It was agreed, however, on the motion of Mr. H. Tryon, that the Conference put on record its belief that the question was well worthy of further elucidation by those who had the time and opportunity for such experiments. So far as we are concerned, whilst fully recognising the interest of the question, we have little hopes of ever seeing anything of permanent good arising from such experiments. We question, in the first place, the probability of obtaining a satisfactory and permanent suture betwixt these so-called native vines and the varieties of Vitis vinifera. Their botanical relationship is no closer than that of Vitis rotundifolia, a notoriously useless stock for European vines. And, secondly, should the grafts prove successful, there is every probability of the roots of the native vines (if true Vites they be) succumbing to the attacks of the insects, as has hitherto been the case with all true Vites not native of that special part of the American continent that has bequeathed us the phylloxera.

Local Biology of the Phylloxera.

This question was referred to a special committee, who selected Mr. H. Tryon as their reporter. In the report it was pointed out that, though originally there existed some doubt on the subject, the identity of the insect at present destroying the vineyards of Victoria, New South Wales, and New Zealand with the American Phylloxera vastatrix must now be accepted. It was recognised that up to the present moment no local study of the biology of the insect had been made, and that in consequence the findings of American and European workers have (provisionally) to be adopted. It was urged that differences in climate and soil might involve differences of life history of considerable importance, and that, in consequence, local studies on the subject by competent men were a crying desideratum. The presence of the winged form in Australia had been questioned. Nevertheless it had been noted in large numbers in New South Wales, and if it had not been authoritatively recognised in Victoria, it is probably because it had not been looked for with sufficient care. The report was adopted, and will be found in full with the proceedings of the Conference.

Part II.

Vegetation Diseases Acts.

The legislative enactments dealing with diseases in plants in the colonies represented at the Conference were discussed.

In the first instance they were considered in connection with the different laws relating to phylloxera. After a short discussion the impracticability of consolidating the law dealing with general diseases in vegetation, and that with phylloxera alone, in any colony was soon apparent, and a resolution embodying this passed without dissent.

With a view to formulating uniform rules in dealing with diseases affecting vegetation generally within the colonies, at the request of the Conference the chief executive officer present from each colony explained the provisions and methods of administering the Acts in the respective provinces.

With this information before it the Conference concluded it is desirable that the main general provisions of the Acts should be uniform, but as the members proceeded to discuss these general principles difficulties soon appeared, owing to the very diverse conditions existing in the different colonies.

The Conference then proceeded to the discussion of the points coming under the headings of "Importations," "Exportations," and "Internal Methods of Combating Diseases."

Importations and Exportations.

Respecting the importation of plants from colonies and countries in which phylloxera occurs, it was resolved that all such should be accompanied by an official certificate declaring they had not been grown within 100yds. of any grape vine. This precaution was suggested quite apart from any method of disinfection or inspection. Beyond the fact that the trouble of procuring such a certificate may deter some persons carrying or forwarding plants of questionable value, we are not quite certain that much assurance can be set upon such declarations.

The exchange of certificates of inspection and disinfection was fully discussed. The acceptance of certificates of inspection only was questioned, but an attempt to substitute certificates of disinfection failed to gain full approval. The form of certificate adopted by this department was produced by a Queensland delegate, who, with others, commended its general acceptance. Although no general decision was arrived at on this matter, the impression in favor of the South Australian form of certificate was marked.

In the eastern colonies a distinct brand representing a crown over the word "passed" has been in use for some time, but this was not deemed a complete success, as it left room for deception by refilling the cases with fruits or plants not duly examined. As we do not admit anything without inspection this matter did not concern us. Should diseased plants or fruits be submitted for admission to any colony, the Conference recommended that disinfection (if at all practicable and safe) should be utilised in preference to ordering the destruction of the goods. From the discussion upon this evolved the recommendation that the principal ports of entry should be provided with fumigating rooms or other means of disinfection. When destruction was considered absolutely necessary, fire heat was recommended as the most certain means of minimising the escape of diseases.

Adequate powers of quarantine for suspected articles should be conferred upon the officials. This was deemed necessary on account of the difficulty of determining at once the results of disinfection when applied for the destruction of certain diseases.

The Conference considered that should there be any exceptions in the case of prohibited articles, the power to introduce such should be vested in the Minister of Agriculture only; and hopes were expressed that in every instance before exercising such powers the Minister would, in the best interests of growers, consult the most reliable experts available.

Respecting the transportation by sea of scale-infested fruits or plants, it was considered that disinfection under official supervision at the port of export should be optional, but in the transmission overland all such disinfection should be performed at the place of export.

A proposal was brought forward suggesting a compilation of a list of diseases, and the recommendation to the several Governments that they be proclaimed as diseases within the meaning of the various Acts. It was, however, soon noticeable that there are diseases which under the climatic conditions of some colonies are extremely destructive, prolific, and not readily amenable to repressive measures, and which again in other colonies are not sufficiently injurious, or yield so readily to treatment that they are not considered worthy of any legislative attention. After mature deliberation, the Conference unanimously agreed that under the circumstances the proclamation of diseases within the meaning of their Act could only be satisfactorily decided by the authorities in each colony. To prevent any sudden dislocation of trade, a recommendation was passed suggesting that immediately on any proclamation being issued in any colony copies of the same should be at once forwarded to the Agricultural Departments of the other colonies.

Internal Action to Suppress Diseases.

In this connection it was considered highly desirable that a systematic inspection of the orchards and nurseries of the colonies should be instituted and maintained.

The question of granting certificates of freedom from diseases to nurseries for any fixed period was condemned as being unreliable, unscientific, and impracticable, owing to the diversity which must occur in the decisions of the various colonies as to what diseases they shall consider necessary to prohibit.

A regulation at present in force in Queensland, compelling every nurseryman to disinfect all stocks before sending them out of the nursery, commended itself favorably to the Conference, as aiming at the better protection of the fruitgrowers. A motion suggesting the general adoption of this in the colonies was carried.

Following upon these lines, the Conference was of the opinion that, to be consistent in aiming to secure the greatest good in the repression of diseases in the orchards of the colonies, the various Governments should not only obtain but exercise power to prevent any person keeping, selling, exposing or offering for sale, or in any manner causing the distribution of any article affected by disease.

In connection with recognised antidotes for diseases in vegetation, it was resolved to ask the authorities of each colony to compel vendors of chemicals used as insecticides and fungicides to state in connection with each sale the chemical composition of the articles comprised in the transaction, as is now done in this colony in vending artificial manures.

The Conference also considered it to be desirable that each colony adopt some means—such as those presented by the departmental journals—of publishing from time to time information concerning matters dealt with under the several Acts, so that the experiences of each colony may be available to the others.

On the whole, we are of the opinion that the resolutions of the Conference in connection with vegetation diseases, as outlined in Part II. of this report, are highly satisfactory from a South Australian point of view. We feel that the stand taken by this department in connection with the importation of plants and fruits and the internal administration of the laws relating to diseases of vegetation are upon lines which have recommended them for adoption by the other colonies to a very large degree. A comparison of the resolutions arrived at by the Conference with our methods of dealing with diseases in vegetation shows conclusively a tendency to aim at the standards adopted here. In no instance did a resolution run counter to our practices, and any advances beyond them make in our favor. We think we are perfectly justified in assuming that in the future the intercolonial trade in fruits and plants will be facilitated by the clearer knowledge gained by the officers of the different colonies respecting the methods and objects sought in the administration of the Vegetation Diseases Acts of the colonies represented at the Conference.

Such, then, is a brief summary of what was done at the Melbourne Intercolonial Phylloxera Conference. In our report we have naturally given prominence to points that more immediately affect South Australian interests. Those desirous of further details will no doubt find them in the full report of the proceedings of the Conference, to be printed by the Victorian Government.

We cannot close without expressing our gratitude for the kindness and hospitality extended to us by the Victorian Agricultural Department; and we trust that, whatever be the course they may ultimately determine upon pursuing, it will be one that will bring prosperity to Victorian vine-growing interests.

ARTHUR J. PERKINS, Government Viticulturist and Œnologist.
GEORGE QUINN, Inspector of Fruit and Horticultural Instructor.

September 26th, 1899.

To the Hon. Minister of Agriculture.

SPRAYING FOR CODLIN MOTH.

BY GEO. QUINN, HORTICULTURAL INSTRUCTOR.

A letter recently received from Mr. Burney Young, Manager of the South Australian Depôt in London, by the Hon. the Minister of Agriculture shows that in England fruitgrowers are beginning to awake to the value of spraying with arsenical compounds for the suppression of this pest.

In a recent work on "Fruit Culture," written by Mr. S. T. Wright, the present Curator of the Royal Horticultural Gardens at Chiswick, Mr. Young noted references to the success attending the use of Paris green sprays upon codlin moth.

Mr. Young wrote to Mr. Wright for further particulars, which that authority on English fruit culture supplied as under:—

> When I had charge of the Glewstone Fruit Plantations I quite accidentally discovered that wherever we sprayed with Paris green for the larva of the winter moth *we had no attack of the codlin moth*, while the trees side by side, not sprayed, lost more or less of their fruit by the larvæ of the codlin moth.
>
> Many experiments were made to test the matter fully, and I always found that by spraying with 1oz. of Paris green to 20galls. of water immediately after the fruit was set, and repeating the process if rain fell, that we were absolutely free from any attack by the codlin moth, and *ten years' further experience* has proved the correctness of the above.

In October the petals will have fallen from most of our pear and apple trees, and I would strongly advise those of our orchardists whose plantations are on comparatively level ground, where the spray-pump may be used from a vehicle and the trees are of a moderate height, to utilise this method.

In steep hilly country I am quite convinced the cost of carrying the appliances and materials prohibits their use on a large scale, but on country suitable for the easy passage of carts the work can be done at a very reasonable outlay.

One of our largest growers in the hills recently assured me that last season he had sprayed several times with solutions of the arsenite of soda and lime water, and was positive that it was owing to this treatment that only a very small percentage of wormy fruit was harvested in comparison with previous years.

In my experiments at Marion the rows sprayed with this compound gave a much lesser number of infested fruits than those rows—containing the same varieties—sprayed with Paris green.

All authorities agree that the best results are obtained by applying the spray while the calyx cups are still open. Our observations here certainly show that a large percentage of the first larvæ of the season enter the calyx ends of the fruits. The ordinary method of drenching the trees, used when spraying for fungoid and some insect pests, is not advisable in the application of arsenical sprays, more particularly Paris green, which does not dissolve.

An examination of the fruits and foliage with a magnifying glass, after the liquid has dried, will show that a light misty spray delivered from a pump provided with an automatic agitator leaves the particles of Paris green well distributed. If delivered in force until the liquid runs off, the heavy particles of Paris green drop off as well, leaving only a few grains at the lower end of the fruit.

The question of cost is also intimately connected with this, as the light dressing can be applied in a much shorter time and at an expenditure of about two-thirds the quantity of materials as compared with heavier but less effective spraying.

The number of sprayings necessary here, where the insect passes through several generations during each season, is yet an unsettled point. In my experiments at Marion the rows sprayed four times with Paris green showed in some instances as few infested fruits as some sprayed seven times.

Some American authorities affirm that any sprayings given after the calyx leaves close over the calyx cup are of no value, but of this I am not convinced.

What is wanted is that a test be made in an orchard (where every other care is taken *re* cleaning, banding, collection of infected fruit, &c.) by setting aside a certain number of trees, and spraying some once, others twice, and so on until some sections have received, say, half a dozen dressings at fortnightly intervals. By this method being applied to apples and pears of various seasons of ripening the comparative value of a certain number of applications could be reached.

Paris green—which has been attested pure—should be used at the rate of 1oz. to 10galls. of water, and from ½lb. to 1lb. of fresh lime slaked and strained into each 10galls. of water. If the lime is good and freshly burned, the lesser quantity is sufficient to prevent damage to foliage, and indicate the progress of the spraying. The larger quantity is apt to disfigure, though no injury is discernible to the foliage. To assure the safety of the foliage the Paris green should be mixed with a small quantity of strong lime water for an hour or so before being used.

The arsenite of soda is made by placing 2lbs. of common washing soda in 1gall. of water in some old tin or boiler; a kerosine tin is best, as it may be destroyed after using to prevent danger of poisoning to man or animals. When the soda is dissolved stir in 1lb. white arsenic, and boil and stir the mixture until all is dissolved. When this is accomplished any waste of water through boiling should be made up to complete a gallon quantity. This liquid is like dirty water, and should be carefully labelled and locked up to prevent mistakes. When using, add 1pt. to 40galls. of water, into which about 4lbs. of fresh lime has been slaked and strained. It is also advisable to pour the pint of arsenite of soda solution into strong lime water some time prior to using it as a spray. In applying these sprays, particularly the last named, the workmen should not breathe in the spray particles unnecessarily.

ORCHARD NOTES FOR OCTOBER

By George Quinn, Horticultural Instructor.

Cultivation.

In pretty well all parts of the colony the surface of the orchard will have been scarified down to a fine tilth, and after each fall of rain, if sufficient to cause the top to form into the slightest crust, the cultivator should be again run through. In most, if not all, orchard lands the subsoil has not up to this date received a supply of moisture sufficient to carry the trees in perfect vigor through the summer.

To make up for this deficiency the closest attention is necessary to conserve as long as possible by cultivation the small quantity that has penetrated. It should be borne in mind that not only must the trees have sufficient moisture to carry to maturity the present season's fruit crop, but provision for next year's fruit must be made by the production of well-grown wood, bearing fully-matured buds.

Disbudding Newly-planted Trees.

Much good can be done now by carefully going over young trees and regulating the newly-formed shoots by rubbing them out.

On trees set out during the past winter, the location and proper distribution of the main arms upon the trunk can be settled very quickly and much energy conserved to the tree.

On most trees the main arms should not arise from buds closely grouped upon the stem; consequently, where a good many buds start, alternate growths may be pinched back or rubbed out completely to affect this wider distribution.

Trees more than one season planted may possess unevenly grown branches; and, to balance the tree, it may be necessary to pinch the points out of the leading growths upon the stronger branches. These temporary checks enable the weaker branches to make up leeway.

The disbudding of older peach and apricot trees is also necessary. It will be noted that after these trees have been winter pruned fairly hard, many hitherto dormant buds burst in pairs at the bases of old laterals. If these growths are not thinned they become too dense, and in the struggle for existence many fail entirely, while others are visibly weakened. To avoid this the trees should be examined and the number regulated by rubbing off those considered superfluous.

Transplanting Citrus Trees.

This work can still be carried on with safety where water is available and the distance of removal is not too great. Most of these trees have made young shoots, and (except in the case of very small specimens, moved without losing any earth from the roots) these young sappy points should be pinched back to firm wood.

Most of our nursery stocks are grown in free, deep soils, consequently citrus trees come up almost devoid of soil. Loose soil is then bagged round them. This is very well to keep in moisture, but often deceives the amateur and beginner. Such trees should have the roots trimmed prior to planting. When set out the tops should be reduced in proportion, and if this necessitates the removal of the shading foliage, the stems should be loosely bound around with bagging to protect the bark from sun heat.

These trees should be planted about 2in. higher out of the soil than they stood in the nursery. Immediately on being set out a good watering must be supplied, and if any litter or manure is available a thin mulch of about 3ft. in diameter should be spread around, but not in contact with the stems. If this is not available, as soon as the ground has lost its stickiness where the water was applied, it should be broken up and finely pulverised to prevent evaporation.

Thinning Fruit.

By the end of this month the natural "drop" will take place of apricot and peach fruits, and then thinning should begin, if necessary. The general principle can only be outlined here. By having a lesser number of fruits a larger aggregate of pulp is secured and a lesser proportion of stone and kernel. The latter are the most exhausting upon the tree and soil.

The number of fruits to leave will always depend upon the condition of each tree, and even each fruit-bearing branch.

All things being equal, apricots require 3in. or 4in. of twig each, and peaches 5in. or 6in. individually. There are many instances where two apricots arise together from the same bud cluster, and these should not be disturbed, because removing one often causes the other to fall. The even distribution of the fruit throughout the tree in accordance with its apparent vitality is the only reliable guide, and the knowledge required to obtain this is not obtained excepting by experience.

Budding and Grafting.

In late districts ordinary grafting may be performed upon deciduous trees. In earlier localities rind grafting (see Plate V. in September issue) should be performed. All suckers arising from grafted or budded trees should be rigorously suppressed from time to time. Rind grafting could be practised upon olives or citrus trees now; but upon the latter budding should be preferred. In selecting buds from citrus trees the beginner is often perplexed by the angular form assumed by the young wood from which he wishes to take buds. This should be discarded, and the lower rounded and more ripened portions taken. Always take buds from healthy trees possessing few thorns, and known to produce good crops of fruit of high quality. Do not use a bud alongside of which a small thorn is growing, as this increases the difficulties of the work.

Guavas and Passion Fruits.

These trees and vines should be planted now in warm sheltered positions in soils that are free and well drained. They like a good deal of moisture, and the passion vines do not like to be trained on a northern stone or brick wall owing to the excessive heat coming from the building.

Pests.

Codlin moths begin to emerge now, and preparations for spraying, as shown in separate article, should be made.

Black aphides on orange and peach should receive attention by repeated dressings of resin wash, or kerosine emulsion, or tobacco and soap washes. The latter is preferable, in my opinion. In bad attacks of the peach aphides, a calico sheet enclosing the tree beneath which damp tobacco is burnt, is the most complete remedy.

In spraying, the wash should drench the ground as well as tree, to be effective in severe attacks.

Sprayings of resin or kerosine washes for "black scale" may be used now; and, if the weather be humid, it may be necessary to spray apricot, apple, and pear trees with summer strength Bordeaux mixture, made of 1lb. lime, 1lb. bluestone, 10galls. water to check fungus diseases.

NOTES ON VEGETABLE-GROWING FOR OCTOBER.

By George Quinn, Horticultural Instructor.

The temperature of the soil is now rising, and the main crops of summer vegetables should be sown. All kinds of melons, marrows, cucumbers, &c., like plenty of old farmyard manure, provided they are not sown or planted directly upon it. New ground, if available, will usually give the best crop of melons. In these notes I generally abstain from naming varieties on account of want of space, but now propose to give a few which are procurable and known to be valuable from local experiences.

In cucumbers Long Green, Rollison's Telegraph, Man of Kent, Sion House Improved, and Japanese Climbing should be tried. Watermelons: Cuban Queen, Kolb's Gem, Rattlesnake, Seminole, The Boss. Sweet Melons: Early Hackensack, Montreal Nutmeg, Victory of Bath. Pumpkins: Turk's Turban, Ironbark, Yellow Mammoth. Marrows: Long White, Custard, Tripoli Bush. Trombone: Green, and the White Trombone, known as Jonathan Pumpkin, is commended. Pie Melon: Long Green, Long White, Round Green, Royal George. In Tomatoes for bulk crop Acme, Ruby, Large Red, Mikado are standard sorts; Ponderosa and General Garfield are very large, but as bulk varieties scarcely equal to the others.

Beans of the edible podded kinds should be sown. In cool sheltered positions the running varieties succeed well, but on the open country the dwarf sorts are preferable. Of these latter Canadian Wonder leads as a general cropper; other sorts, such as Emperor William and Best of All, are much more rapid in podding, and for early sowings are worthy of trial by growers for market. Sown on the same date alongside the Canadian Wonder, the Best of All will yield pods of a marketable size quite a fortnight earlier.

All seeds sown now should have a thin mulch of finely-broken manure spread over them—not in direct contact, but over the thin covering of soil above the seed.

Melons, cucumbers, and tomatoes of earlier sowings will require sheltering from rough winds for some time. If aphides attack them—small crumpled foliage is a suspicious sign of the presence of these pests—mild sprayings, delivered upwards from beneath the leaves, of tobacco and soap mixture will check their ravages.

As soon as the plants of the melon family begin to make runners the surface of the ground should be lightly mulched with manure, if this is available. This keeps the soil moist and cool. Most of the pumpkins, trombones, and marrows under such treatment will root at the joints of the runners and thus strengthen themselves.

The soil between all growing crops should be kept broken by fork or hoe. This operation conserves moisture and destroys weeds. The latter do more harm by extracting moisture than plant food at this period of the year. Salad plants should now be sown only in sheltered cool spots upon the plains.

In saving any of the finer cabbages and cauliflowers for seed purposes, the plants, prior to the opening of the flowers, should be securely covered with fine gauze to prevent insects crossing them with pollen from inferior sorts. If all inferior kinds were pulled up this would be unnecessary. This covering need not be retained after the blooms have fallen, and it may be mentioned that the covering should not rest upon the flowers. The late crops of potatoes upon the plains should be hoed and hilled up, if the latter practice be deemed necessary. In the wet gullies in the hills the main crops of vegetables will now be set out, and the operations coincide pretty well with those suggested for midwinter on the plains.

POISONS FOR SMALL BIRDS.

Considerable inquiry has been made of the editor at various times for particulars of methods of poisoning grain, &c., for sparrows and other small grain-eating birds. The following recipes will be found of value, and the editor will be glad to hear of other proved methods.

Arsenic and Wheat.—(*a*) Boil 1lb. arsenic, 1lb. washing soda, and 1lb. of sugar in 2galls. of water for about twenty minutes. Put in a tub or other receptacle, and stir in about 40lbs. of wheat. Allow it to soak for about twelve hours, then spread thinly on galvanized iron or canvas to dry. (*b*) Dissolve 8oz. of arsenate of soda in 1gall. of warm water. Pour this over as much wheat as it will cover; close the vessel to prevent evaporation, and allow it to soak for about twenty-four hours. Spread the wheat thinly to dry it. (*c*) Crush 30lbs. wheat, mix with it about 4lbs. flour and 1lb. sugar, and then sprinkle with 1lb. arsenic.

Strychnine and Wheat.—(*a*) Put 1drm. of strychnine and half a cup of vinegar in a pickle or other bottle, and boil same slowly in another vessel of water until the strychnine is dissolved. Put about 20lbs. wheat in a vessel, add 1gall. *hot* water to the strychnine and vinegar and pour over the wheat; then stir well. Allow it to stand for twenty-four hours, stirring accordingly; then spread it out thinly to dry. (*b*) Crush some wheat, add a little flour and sugar, and sprinkle same with strychnine.

Strychnine and Bread.—Spread butter thinly on dry bread, sprinkle with strychnine and break up small.

Plaster of Paris and Grain.—Mix a little plaster of Paris and sugar with crushed wheat or other grain. Place it where the birds can obtain it. There being no taste about the plaster of Paris, and as it kills slowly by stopping up the intestines, it is stated the birds will take this mixture more readily than poison which kills quickly.

The preparation of the fatal meal is, however, less than half the battle, as it is exceedingly difficult to get the birds, and particularly sparrows, to take it in sufficient quantity to cause a general slaughter. Various methods will need to be tried to deceive them into taking the poison. To secure the greatest success it is necessary that there should be a simultaneous effort throughout each neighborhood to destroy the birds. For several days—the longer the better—good grain should be distributed to give the birds confidence. In hot weather, in districts where there is no other water, vessels containing pure water should also be placed where the birds will come to it. Then, on a day to be fixed, the poisoned food should be substituted. In order to more readily deceive the birds the grain should be mixed with chaff, dry horse dung, or other short material, and scattered about as though spilled accidentally. If it is spread too thickly the sparrows become very suspicious, and are inclined to watch some other bird test the effects of the tempting delicacy placed within his reach. Placing poisoned water for the birds is also very effectual if the birds have no other water readily available.

In using these methods every care must be taken in handling, and all materials be placed out of reach of children to prevent accident. All domestic birds must be safely enclosed before the poison is distributed, and any grain that remains should be carefully cleaned up before they are released again. The example set by Cherry Gardens Agricultural Bureau might be followed with advantage in other districts. The members of the Bureau subscribe or collect from the residents sufficient money to offer small prizes each quarter to the boy who has collected the most heads and eggs of sparrows, All the heads and eggs become the property of the members, and are destroyed. This method appears to be more effectual than offering so much per hundred, as the boys hope to win, say, 10s., where if payment was made at per hundred they might receive only half that sum. The sum of £5 per annum offered in this way in prizes of, say, 10s. and 7s. 6d. for heads and 7s. 6d. and 5s. for eggs each quarter in each district, together with systematic attempts to poison the birds, would have a very marked benefit in mitigating the damage wrought by these feathered pests.

Before laying poison for any birds be perfectly sure that the birds do more harm than good during the whole year. Some birds destroy myriads of caterpillars, grubs, moths, &c., all the year round, but for a short time also attack fruit, grain, and other crops.

If poisons must be resorted to, those which involve steeping in liquid solutions are decidedly the most effecttve.

MONTHLY RAINFALL.

The following table shows the rainfall for September: —

Adelaide	1·78
Wilson	1·81
Quorn	1·34
Port Germein	1·02
Port Pirie	1·16
Crystal Brook	1·48
Port Broughton	1·62
Hammond	1·56
Bruce	1·26
Melrose	1·73
Wirrabara	1·55
Appila	2·02
Laura	1·95
Caltowie	1·89
Jamestown	1·76
Gladstone	1·71
Georgetown	2·06
Narridy	1·82
Redhill	1·48
Koolunga	1·41
Carrieton	2·23
Eurelia	2·33
Black Rock	2·01
Petersburg	2·13
Yongala	2·00
Terowie	2·41
Yarcowie	2·50
Hallett	2·22
Burra	2·34
Snowtown	1·45
Brinkworth	1·80
Blyth	2·02
Clare	2·77
Mintaro Central	2·36
Watervale	3·34
Auburn	2·12
Manoora	2·36
Hoyleton	3·64
Balaklava	2·29
Port Wakefield	1 60
Saddleworth	1·80
Marrabel	2·13
Riverton	1·93
Tarlee	1·80
Stockport	1·82
Hamley Bridge	1·56
Kapunda	2·55
Freeling	3·04
Stockwell	2·44
Nuriootpa	2·45
Angaston	2·20
Tanunda	2·22
Lyndoch	1·45
Mallala	1·80
Roseworthy	1·83
Gawler	2·00
Smithfield	1·82
Two Wells	1·39
Virginia	1·40
Salisbury	1·49
Teatree Gully	2·25
Magill	1·94
Crafers	2·03
Clarendon	2·51
Morphett Vale	2·04
Noarlunga	1·95
Willunga	2·13
Aldinga	1·77
Normanville	1·68
Yankalilla	1·82
Eudunda	2·25
Truro	2·78
Mount Pleasant	2·52
Blumberg	2·28
Gumeracha	2·37
Lobethal	2·43
Woodside	2·61
Hahndorf	2·64
Nairne	2·45
Mount Barker	2·36
Echunga	2·46
Macclesfield	2·73
Meadows	2·93
Strathalbyn	2·30
Callington	1·79
Langhorne's Bridge	2·00
Milang	1·93
Wallaroo	1·61
Kadina	1·56
Moonta	1·39
Green's Plains	1·30
Maitland	1·60
Ardrossan	1·66
Port Victoria	1·62
Curramulka	1·79
Minlaton	2·02
Stansbury	2·48
Warooka	2·45
Yorketown	2·54
Edithburgh	1·98
Fowler's Bay	1·35
Streaky Bay	1·96
Port Elliston	1·48
Port Lincoln	2·41
Cowell	2·11
Queenscliffe	1·63
Port Elliot	2·34
Goolwa	2·07
Meningie	1·71
Kingston	1·53
Robe	1·55
Beachport	1·77
Bordertown	1·48
Wolseley	1·29
Frances	1·12
Naracoorte	1·34
Lucindale	1·49
Penola	1·45
Millicent	2·00
Mount Gambier	2·31
Wellington	2·12
Murray Bridge	1·68
Mannum	2·17
Morgan	1·62
Overland Corner	1·34
Renmark	0·76

WEATHER AND CROP REPORTS.

AMYTON.—The dry weather in April and May caused the early wheats to run to head in June. The later sown and also the late varieties of the early-sown wheats were also forced into head prematurely by dry weather in July and August; but the timely rains of September will enable the ears, though small, to fill out well, and with a continuation of favorable weather a fair crop is expected. Feed is plentiful and stock in good condition, but locusts are doing considerable damage to the grass.

BALAKLAVA.—Since last month a marked change in the condition of the district has occurred. Splendid rains, from 1¼in. to 2in., have been recorded, and the wheat and feed have made a surprising improvement. The hay crop will be light, but with fair late rains the wheat may yield well, though short in the straw. Farmers will be able to finish fallowing, and to work the early fallows ready for the summer.

BURRA (West Side).—We have had 2·11in. of rain for month to 24th. The crops are looking splendid, but feed is not so good as at this time last year. Shearing has just commenced.

BORDERTOWN.—The long spell of dry weather has now broken up, and, notwithstanding the two months' dry weather, and over thirty frosts, the crops have held out well, principally owing to the use of the drill and manures. Should the weather during the next month prove showery, we may rely on a good crop, but the grass has suffered severely and the feed is short.

CALCA.—Early in the month 2in. of rain fell, and has made marked difference in the appearance of crops. Crops generally are healthy, but very backward. Grass is short and will be scarce before the end of the summer. Shearing has commenced and the clip will be good. Lambing will be almost *nil*.

CALLINGTON.—Steady rains fell early in the month. The hay and wheat crops are looking healthy. Grass is somewhat short, but the rain will improve things.

DOWLINGVILLE.—Crop prospects have vastly improved during the month, about 1¼in of steady rain having fallen. Feed will be short. Stock only in middling condition.

ELBOW HILL.—Agricultural prospects are looking up since last report. We have had two fine rains, in all nearly 2in., and the wheat and feed have made wonderful progress, though the crops will not be heavy on account of suffering too much in the early part of year. There is every evidence to prove that manuring will pay well in this district, more especially in the hills.

GAWLER RIVER.—The long spell of dry weather had a marked effect on the crops, and especially on the feed, which was dying off on the plains; but the rain has revived things wonderfully, and with a little more rain next month most of the crops will do well. Stock in good condition. Fallowing has been pushed on since the rain.

JOHNSBURG.—The best September rains we have had for years fell early this month, 1·76in. being registered. Light showers have fallen since, and the feed and crops have made a wonderful improvement. With some rains early in October and mild weather fair crops will be harvested. Feed is becoming plentiful, fallowing is going on briskly, and everyone is in high spirits at the improved prospects.

KAPUNDA.—Crops are growing rapidly since the rain. The season as a whole has been exceptional. We had nice rains at seed-time, and the grain germinated better than usual; then dry weather and frosts were experienced for such a long period that farmers had lost hope of a hay crop. The past few weeks have again proved that when the wheat crop gets a good start it takes a lot of adverse weather to kill it. Stock are in fair condition.

LUCINDALE.—Splendid rains have fallen this month, which have been of great benefit to crops and grass. Unfortunately parts of the district are suffering from a caterpillar plague, and whole sections are completely denuded of grass. The lambing has been a good one, and stock generally in good condition. Owing to the dry winter hay crops are likely to be heavy this season.

MINLATON.—Since last report splendid showers have fallen, reviving the crops wonderfully. There is now promise of some heavy yields of wheat, but hay will be short. Farmers now busy fallowing or working the fallows. Stock in fair condition, and feed fairly plentiful.

MOUNT REMARKABLE. Splendid rains have been recorded, followed by mild warm weather. Crops promising, some very good; on the whole good returns will be obtained in this district. Feed is abundant. Fruit yield is promising. Frost on September 24 cut the potato crops. Rainfall for month, 1·54in.

MURRAY BRIDGE.—We are experiencing most seasonable weather, about 2in. of rain having been recorded within a fortnight. Crops and grass are fast recovering from the effects of the long dry spell. Wheat in fallowed land is well forward and promising. Grass is growing vigorously. Stock improving in condition.

NANTAWARRA.—Since last report good steady rains have fallen, with very beneficial effect upon the crops. Stock of all kinds doing well.

Pine Forest.—Over 1¼in. of rain have fallen this month, greatly reviving the crops, which in most parts look fairly well. Feed is backward and water scarce. Stock are in fair condition. Shearing will commence early in October, but the clip will not be as good as last year.

Port Elliot.—We have shared in the bounteous rain this month, over 2in. falling within the fortnight. This has been followed by mild weather, and has made a wonderful difference in the appearance of the country. Being a late district a great deal depends upon the October weather, and a fair amount of rain is required to bring on the hay, potato, and other crops.

Pyap.—Crops are showing effects of the late frosts, but the yield will not be greatly affected. Rainfall for month, 1·25in.

Riverton.—Seasonable showers have fallen during the month, about 1½in. being recorded to the 17th. The crops are now looking well.

Saddleworth.—Wheat plant growing well; manured crops of early-maturing wheats are very promising. Feed is very short. Sorghum has been got in in good order. Rainfall this month, 1⅛in., making 11⅛in. for the past nine months; this is 4in. under our average. The want of good soaking rains will be felt later on.

Stansbury.—Crops are looking fairly well considering the dry season, but the 1½in. of rain recorded this month has freshened up the crops wonderfully. The hay crop will, however, be light.

Wilmington.—We have had some splendid rain, over 1½in., which came just in time. With continued seasonable weather a fair harvest may be expected.

Wilson.—The splendid rains early in the month have completely altered the appearance of things all round. The rain has been followed by mild weather and light showers, and we are now fairly sure of some crop. With further showers the season should turn out very well.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— September 30, 1899.

With the phenomenally dry July-August the outlook when last we wrote was very discouraging, but it has always been recognised that September is our most critical time—prospects of many past seasons that had opened auspiciously having been destroyed by dry, hot winds, and other early summer conditions during that month. September this year, however, has been nearly all that could be desired, heavy general rains in the early part being followed at intervals by showery weather, interspersed with good growing conditions, so that prospects have wonderfully improved, and even in most of the earlier districts the crops have come along splendidly, now promising fair yields. Of course one must not forget that it is unsafe in our climate to prophesy harvest results, though the risks of forecasting cannot be very great now that we are within four weeks of the commencement of reaping. In some parts more rain is wanted to fill tanks and dams, the recent falls having been of a steady, soaking character, which the ground nearly all absorbed, few watercourses feeling the influence, though the fresh impetus given to vegetation ensures a supply of good summer feed.

The improved prospects in the wool trade have been fully realised at the opening sales in Adelaide by a substantial all round advance, and it is to be hoped that this will lead to the early re-occupation of the many extensive station properties which, with all their valuable plant, are now idle in the hands of paid caretakers.

Commercial circles reflect the marked improvement in country prospects, and the growing confidence expressed in Europe concerning the permanency of the advance in value of most of our chief staples is giving increased confidence to colonial investors, so that developments in copper and other mining, as well as in agronomical pursuits, is being extended.

The breadstuffs market has been well sustained during the month by the demand from South Africa for wheat and flour, at prices that have sent our market relatively higher than London, where values, however, have well held and give prospects of a firm market during their winter. The export trade has reduced local millers' stocks of flour so much that they are becoming more eager buyers of wheat still in farmers' hands. Our intercolonial trade is stagnant, Adelaide flour in Sydney being actually obtainable at less than millers' quotations f.o.b. here. Melbourne is busy fulfilling South African orders, so that business between colonies is limited to contracts entered into earlier in the season. Bran and pollard continued to advance until the rains set in, which caused an easing in millers' offal lines, as well as other forage.

Business in potatoes has been lifeless. Our market being entirely dependent upon imported, which are a glut in Victoria, Tasmania, and New Zealand, consignments forced on this market have cleared little over cost of sacks, freight, duty, and loading charges. The season, however, for old potatoes is now nearly passed, and local new are beginning to come forward. Quiet trade only doing in onions. The market at moment is controlled mostly by one grower, who has been easing off his surplus through exportation to West Australia. Values have fallen back about 10s. during the month.

Moderate local business doing in dairy products. Butter improved slightly in price during the first week of the month under review, but towards the latter part eased back again. A strongly advancing market in Europe, however, is bound soon to have its effect on local trade, as exporters are keenly operating on all available for London shipments, as well as for inter-colonial markets. Compared with twelve months ago, the market is some 20s. per cwt. higher in Europe, and good prices are likely to continue at least to the end of the year, although an easing off is prognosticated by some as soon as Australian shipments begin to freely reach Britain. Consignees in London, when latest mail advices left, were anxiously looking forward to arrival of new Australian butter, and speaking confidently of an early quittance of cold-storage lots which earlier in the season had in America and Britain rendered the future of the market somewhat uncertain, until the unusually dry spell of weather in the Northern Hemisphere materially checked their summer output. A marked improvement is shown in prices obtained here for bulk, and the market continues to display advancing tendency. Eggs during the month receded more than expected, until 5d per dozen was touched at several sales, but an improvement is manifest, and demand at moment is fully equal to supply. Prime conditioned cheese continues in request, but there is still a difficulty in disposing of over-ripe samples. An easing in values of the live material has caused bacon to sell about ¼d. lower, but seasonable trade in hams is giving curers an opening for trade in that direction. Honey has ruled very quiet. Beeswax brisk. Supplies of almonds below requirements.

Fair quantities of poultry have been catalogued during the month, for which, excepting turkeys, excellent prices were secured. The latter, however, have been unusually cheap, although during the last week or so an advancing tone has been manifest. With the setting in of warmer weather, which may soon be expected, the season for forwarding carcass pork and veal is almost at an end. Pork is ruling a shade lower, and the average realised for veal has not been so high, but demand for quality in both lines has secured top prices for all choice lots.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Farmers' lots at Port Adelaide, 2s. 10½d. to 2s. 11d.; outports, 2s. 9d. to 2s. 10d. per bushel of 60lbs.

Flour.—City brands, £6 15s. to £6 17s. 6d.; country, £6 2s. 6d. to £6 5s. per ton of 2,000lbs.

Bran, 9d.; pollard, 9d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 7d. to 1s. 9d.; good stout white, 2s. 5d. to 2s. 8d. per bushel of 40lbs.

Barley.—Malting, nominal; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 2s. 6d. to £3 7s. 6d. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Local, new, £5 10s.; Imported, £2 17s. 6d. to £3 2s. 6d. per 2,240lbs.

Onions.—£6 10s. to £6 15s. per 2,240lbs.

Butter.—Creamery and factory prints, 9d. to 9½d.; bulk, 9½d. to 10d.; dairy and collectors' lines, 6½d. to 8½d. per pound.

Cheese.—S.A. factory, best, large to loaf, 6d. to 7d.; ordinary to fair 4½d. to 5½d. per pound.

Bacon.—Factory-cured sides, 6¼d. to 6¾d.; farm lots, 5½d. to 6d. per pound.

Hams.—S.A. factory, scarce, 7d. to 9d. per pound.

Eggs.—Loose, 5½d.; in casks, f.o.b., 7d. per dozen.

Lard.—In bladders, 5d.; tins, 4d. per pound.

Honey.—2d. for best extracted, in 60lb. tins; beeswax, 1s. 1½d. per pound.

Almonds.—Soft shells, 5d. to 5½d.; kernels, 1s. 2d. per pound.

Gum.—Best clear wattle, 2d. per pound.

Carcass Meat - Handy shop carcasses of pork, 4½d. to 5d. per pound; baconers, 3¾d. to 4¼d.; rough and heavy, 3d. to 3½d.; vealers, 1d. for ordinary up to 3d. for primest

Live Poultry.—Fine table roosters, 1s. 8d. to 2s. 2d. each; good hens and medium cockerels, 1s. 3d. to 1s. 7d.; ducks, from 1s. 9d. for small to 2s. 7d. for heavy birds; geese, 3s. 6d.; pigeons, 7½d.; turkeys, from 4¼d. per pound live weight for ordinary up to 6d. for nice table sorts.

IMPORTS OF BACON AND HAM INTO GREAT BRITAIN.—The returns for 1898 show that during that period the bacon and ham imported into Great Britain amounted to 5,711,000cwts., and 1,922,000cwts. respectively, the values being £10,322,000 and £3,894,000 respectively. The principal contributor is the United States, which sends three-fourths of the total, Denmark ranking next with about one-seventh. The imports in these lines show a steady increase, the total value having increased to the extent of nearly 30 per cent. in five years, notwithstanding a steady fall in the average price. In 1898 bacon averaged 36s. 2d. per hundredweight and ham 39s. 6d. per hundredweight.

REPORTS BY BRANCHES.

Forster, August 21.

Present—Messrs. A. Johns (Chairman), F. Towill, J. Sears, J. Johns, F. Johns, A. Schenscher, J. Retallack, W. H. Bennett, and six visitors.

Poultry.—Mr. A. Johns read a paper on "Poultry." He considered, for laying purposes, crosses from Leghorns, Andalusians, Spanish, or Game would be profitable. Care must be taken to keep a supply of young birds coming on. Do not keep the birds after the second laying season. Considerable discussion ensued.

Horses.—The majority of the members favored the Clydesdale breed of horses for farm work in this district.

Port Pirie, August 19.

Present—Messrs. J. Lawrie (Chairman), W. K. Mallyon, T. Gambrell, T. Johns, E. J. Hector, H. B. Welch, G. Hannan, T. Jose, T. A. Wilson, G. M. Wright, W. Wood, P. J. Spain, F. Humphris, W. Smith, and R. J. Ferry (Hon. Sec.).

Field Trial.— Decided to abandon field trial for this season.

Holiday Trip.—Mr. Mallyon related incidents and observations concerning his recent visit to New South Wales and Victoria, contrasting both colonies unfavorably with South Australia in many respects, but admitting that both have great natural advantages which are not largely availed of; and stating that, whilst money is plentiful in some quarters, poverty and vice are rampant in others. Facilities for travelling are greatly in advance of those afforded in South Australia. A large portion of vegetables, and even fodder, is procured in Sydney from Victoria. Mr. Mallyon procured seeds of Sheep's Burnet (Poterium), Paspalum dilitatum, and other fodder plants. He learned that the Hunter River lucern seed is considered to be the best for sowing.

Dowlingville, August 25.

Present—Messrs. R. A. Montgomery (Chairman), T. Illman, T. Lombladt, S. W. Tee, J. Birkin, R. Foggo, H. Crowell, G. Mason, J. Phelps, F. W. Roberts (Hon. Sec.), and three visitors.

Field Trial Society.—Discussion took place on question of asking the Government for land at Paskeville for trials in connection with the Bureau Field Trial Society.

African Box-thorn.—A discussion took place on this plant as a hedge. The Chairman was strongly opposed to it as a fence, as there was a danger of it spreading and eventually becoming a serious nuisance.

Carrieton, August 31.

Present—Messrs. W. J. Gleeson (Chairman), A. Steinke, M. Manning, H. Menz, F. Kaerger, and J. W. Bock (Hon. Sec.).

Forest Reserve.—It was decided to support request of Cradock Branch that portions of the Mattawarangla run should be set apart as a forest reserve.

Rabbit Trap.—Mr. Manning stated that he had made an improvement to wire-netting rabbit traps. He placed a small oil drum at the mouth of the trap and found it very successful, as the rabbits did not seem so suspicious of a trap as when the entrance is wire netting.

Officers.—Messrs. W. J. Gleeson and J. W. Bock were re-elected Chairman and Hon. Secretary, respectively.

Wandearah, September 5.

Present—Messrs. W. Robertson (Chairman), E. Joyce, M. Roberts, W. J. Fuller, R. J. Dennis, J. Wall, L. Stanley, and C. E. Birks (Hon. Sec.).

Early Wheats.—Members reported trial plots of Indian King and Bartlett's crossbred wheats, presented to the Bureau by Mr. R. Marshall, were looking well. One member had purchased a bag of Bartlett's crossbred and the crop was looking much better than other wheats alongside it.

Bonedust.—Samples of finely-ground bonedust of high quality were received from a city firm. Members were of opinion that such manure would be better in the long run than super.

Morphett Vale, September 6.

Present—Messrs. L. F. Christie (Chairman), H. Anderson, F. Hutchinson, J. McLeod, A. Jones, H. Liston, A. Pocock, T. Anderson, A. Perry, A. Ross Reid (Hon. Sec.), and five visitors.

Weeds.—A letter was received from Clarendon Branch advocating the destruction of "soursops" and red poppy. Mr. Hutchinson tabled weeds for identification.

Poultry.—Mr. McLeod read a paper on this subject to the following effect:

Poultry, when properly managed, are a source of considerable profit, yielding more for the food they consume than any other stock, although their value is not often considered. The hen is peculiarly an egg-producing bird. Some breeds are better adapated for laying than others, but to get a reasonable quantity of eggs proper food and attention are wanted. A good-sized egg will weigh 1,000 grains, of which about 107 are shell, 604 are white, and 289 are yolk. Of the shell 97 per cent. is carbonate of lime, 1 per cent. phosphate of lime and magnesia, and 2 per cent. albumen. The white consists of 12 per cent. of albumen, 5 per cent. of salts, and 85 per cent. of water. The yolk has about 18 per cent. of albumen, 28 per cent. of yellow oil, 54 per cent. of water, with a trace of sulphur and phosphorus. These are the constituents of eggs when the hen has free access to the various articles which constitute her natural food, but they vary with circumstances. When full fed and denied access to lime she will lay an egg without a shell. When scantily fed she may lay, but from deficiency of nutriment the egg will be quite watery, and possess but a small portion of the qualities peculiar to them. To produce a large number of good eggs several conditions are important, and they must especially have an abundance of the right kind of food—part in the form of animal food. In warm weather, when they have a free range, they can generally supply their wants in this direction in the abundance of insects, earth worms, &c. Grain is at all times best for them when ground and cooked, as they will lay more, fatten quicker, and eat much less than when fed in the raw state. Do not feed on one kind of grain alone. Wheat is at all times best, but poultry like a change. If you have no other grain buy oats and barley, and also supply them with as much milk as possible. The fowls should be supplied with plenty of clean water, and, if not allowed to run at large, they must be provided with gravel to assist their digestion, and a box or bed of sand or ashes should be placed for them to roll in, for the purpose of ridding themselves of vermin. Pullets should, if possible, be kept by themselves, as a matured hen does not need as much, nor the same kind of food as a growing pullet. Some people say that they like fowls to roost on trees, and that you should not have houses for them; but when you see them leave their tree roosts in wet weather, and look for shelter, it is quite evident that they do not relish their roost, and I think that every one who keeps poultry should provide a good house for them. Inbreeding is one of the most prolific causes of failure in poultry breeding. It may be due to the short-sighted economy of using the rooster too long, because one does not wish to incur the expense of getting another. The result of so much inbreeding is weak offspring. Quite often the

eggs will not hatch, and even if they do, and the fowls live, they will not make as good layers as more vigorous stock. It is better to exchange roosters every year than to inbreed. We know that it is a very common mistake with some, when they have paid a good price for roosters, to keep them as long as possible. This often proves disastrous in more ways than one. Get a good, strong, well-bred rooster, and, if he cannot be exchanged for another of the same breed the next season, buy one; and in this way a flock will soon be brought up to an excellent standard.

Mr. Pocock recommended the Leghorn-Minorca cross, as they will lay from March till Christmas without wanting to sit. The Orpington was a good all-round bird, but rather neglected. For both table and egg purposes the Indian Game-Dorking cross was to be recommended. The Chairman considered eight hens to one rooster sufficient for breeding purposes. Mr. McLeod asked for a good receipt for pickling eggs. [See *Journal of Agriculture* for June, "Water Glass Pickle," and for September, "Lime Pickle." The latter is generally used, and is very successful, but unless the shells are strong it will spoil the eggs.—GEN. SEC.]

EXHIBITS.—Mr. Liston tabled "Earliest of All" wheat, this season's growth, 3ft. 6in. high, and Mr. Hutchinson four fine turnips, green top variety, just over 2lbs. each in weight.

ENSILAGE.—The Hon. Secretary strongly recommended that any surplus green feed should be made into ensilage. He thought the variegated thistle would make good ensilage. Ensilage was almost totally neglected in this district, but was a valuable aid in dairying. [Any green stuff that cattle will eat may be converted into ensilage. Several reports of late years have been received to the effect that the thistle, as well as the common artichoke, frequently to be seen in the Southern district, make good ensilage when mixed with other green stuff.—GEN. SEC.]

Johnsburg, August 26.

Present—Messrs. F. W. Hombsch (Chairman), T. A. Thomas, H. Arnold. T. Potter, L. Chalmers, T. Thomas, W. McRitchie, M. L. Reid, G. H, Dunn, and T. Johnson (Hon. Sec.).

CROWS.—Members reported damage to late sown wheat by crows, the young plants being pulled up by the birds, apparently to obtain the germinated grain. To keep crows from the fruit garden, nailing bright pieces of tin to a board to catch the sun's rays was suggested. Mr. Dunn said they could easily be poisoned by piercing a small hole in an egg, putting in a drop or two of nicotine, and sealing it up.

WEED.—The Chairman tabled plant for identification, and wished to know if it was injurious. Members did not think so, though it caused a taint in milk if the cows ate much of it. [This is a variety of Erysimum, and is eaten by stock. —GEN. SEC.]

SEED EXPERIMENTS.—Mr. McRitchie reported that long yellow carrot from Bureau seed had done well with him; Chantenay did not seem suitable for the North. He could also recommend Dwarf Champion tomato. Mr. T. Thomas said Matchless tomato had done well with him, and he would recommend it. Lazy Wife Pole bean had not done well. Mr. T. A. Thomas recommended Ponderosa tomato as a capital bearer, the fruits being fleshy and of nice quality.

INDIAN RUNNER DUCKS.—Mr. Thomas reported that his ducks were keeping up the reputation of the breed as regular layers, and he thought that by judicious management no difficulty would be experienced in obtaining a supply of eggs throughout the year.

Arden Vale, August 21.

Present—Messrs. A. Hannemann (Chairman), M. Eckert, F. Schuttloffel, A. W. Fricker, L. Warren, D. Liebich, G. Miller, G. H. Williss, and visitors.

ANNUAL REPORT.—The annual report showed that during the year six meetings had been held, with an average attendance of 10·6 members. Five papers had been read and discussed; an annual social held; but, owing to the bad season, the usual show of the products of the district did not take place. Messrs. A. Hannemann, M. Eckert, and E. H. Warren were re-elected Chairman, Vice-chairman, and Hon. Secretary, respectively.

SEED DRILL.—Mr. Eckert reported having attended trial of Farmer's Favorite Seed Drill, at Quorn, and was well satisfied with the work done. He considered the price asked for these machines too high.

STOCK COMPLAINTS.—Mr. E. Venning read a paper on "Some Diseases of Horses and Cattle and their treatment," to the following effect:—

He had had considerable experience in treatment of stock complaints, and could recommend the following treatments as satisfactory. For horses that have eaten too freely of wheat, give three pints of milk and continue pint doses at intervals of thirty to sixty minutes until the wheat is passed; should this fail, give 1½lbs. treacle. For bloat, give ammonium causticum; should inflammation set in, give aconite, belladonna, and arsenicum, alternately, fifteen drops in a glass of water; drench through the nose, and give less frequently as the animal improves. If the horse loses its hair in patches afterwards, give 1gr. of sulphur in bran mash at night, and 1gr. of arsenicum in mash in the morning until cured For external application use an ointment made by mixing 1oz of sulphur with 2ozs. lard, or 4grs. arsenic boiled in 1pt. of distilled water. The latter is useful for mange, but, being poison, should be plainly labelled. For a horse bad from eating too much pollard, give five to seven drops aconite, repeating in fifteen minutes, and half an hour later eighteen drops belladonna; then every hour give aconite and belladonna until an improvement is noticed, when the doses should be less frequent. Give sulphur afterwards. Mares expected to foal should be kept in a convenient place and watched. Foaling should take place in twenty to thirty minutes under favorable circumstances. When necessary to assist the mare the greatest care must be exercised. Mr. Venning also described very fully the symptoms of milk fever in its various stages and the treatment; but as much simpler remedies, which have given most satisfactory results have been given frequently in the *Journal*, space cannot be spared to publish the same.

Stockport, September 11.

Present—Messrs. D. G. Stribling (Chairman), C. W. Smith, J. Smith, T. Mcgaw, T. Howard, J. F. Godfree, F. Watts, S. Smith, and J. Murray (Hon. Sec.).

THE SPRING SHOW.—Messrs. Smith and Godfree consented to inspect implements, machinery, and live stock at the Adelaide Show, and report to this Branch.

Meningie, August 12.

Present—Messrs. M. Linn (Chairman), D. Roberts, C. J. Shipway, T. W. R. Hiscock, Thos. Joy, W. Robinson, A. J. Myren, W. Tiller, Jabez Williams, and H. B. Hacket (Hon. Sec.).

CO-OPERATION.—Members desire to have a central depôt established in connection with the dairy industry.

SAMPHIRE.—For Mr. Scott the Hon. Secretary described how to eradicate samphire. Use light harrows first, which will pull up a lot of bush; a second harrowing with weighted harrows will bring up a lot more, and the rubbish can then be heaped and burned. Members did not agree with this, as they found that the samphire grows more thickly when harrowed up. Mr. W. Tiller thought a weighty roller would be best for the purpose.

Dehorning Cattle.—Mr. Hiscock advocated dehorning cattle when young. Those objecting to this should at least cut off the sharp points and round them off. Mr. Williams said polled cattle try the fences more than those with horns. Messrs. Roberts and Robinson agreed that horns are a disadvantage when trucking cattle, but are very necessary in rough country or scrub, and are a great assistance to them in hooking down branches of trees for food.

Colton, September 6.

Present—Messrs. P. P. Kenny (Chairman), A. S. Bartlett, M. S. W. Kenny, W. L. Brown, B. A. McCaffrey, W. J Packer, W. McK. Elder, and R. Hull (Hon. Sec.).

Official Correspondence.—A question concerning the difference between official and private correspondence in connection with the Branch and mercantile and other firms was discussed, and a resolution was arrived at to the effect that correspondence *re* purchase of goods, freights, &c., is business connected with the work of the Branch. [Most, if not all, of the Branches of the Agricultural Bureau make a small annual levy—say, 2s. 6d. each—for the purpose of providing stationery, stamps, &c., for the conduct of correspondence with merchants, tradesmen, &c., for lighting and cleaning meeting room, and general incidental expenses not strictly connected with the official work of the Bureau.—Gen. Sec.]

Field Trials.—Members consider that it is not fair to farmers or to the makers of machinery and implements to award prizes to such at agricultural shows until after a field trial has been made to test their merits.

Hartley, September 4.

Present—Messrs. A. Dalton (Chairman), J. B. Sanders, H. Reimers, W. Kutzer, H. McAllan, A. Jaensch, J. Jaensch, J. Stanton, A. Thiele, H. Lehmann (Hon. Sec.), and one visitor.

Best Fences for Farms.—A discussion took place on this subject. Mr. Sanders favored stone fences. As a rule the wall should be 4ft. 2in. to 4ft. 6in. high, 2ft. at bottom and 18in. at top. It would help to utilise the stone off the fields, but would be costly. Other members favored sheep-proof fences, 3ft. 7in. to 3ft. 10in. high, six wires, with barb wire on top. Crossbred sheep require a high fence, as they are particularly troublesome in jumping.

Officers.—Mr. A. Dalton, Chairman; Mr. H. Lehmann, Hon. Secretary.

Lucindale, August 25:

Present—Messrs. E. Feuerheerdt (Chairman), S. Tavender, B. Feuerheerdt, A. Carmichael, G. C. Newman, A. Matheson, and A. Dow.

Forestry.—Mr. Dow read a paper, of which the following is the substance:—

Useful timber in this district is becoming more and more scarce. The better trees are being cut, and there are few taking their place, as the young trees are frequently destroyed by bush fires. Means must be adopted to provide a supply of timber for refencing, and all other purposes. Most of the occupiers have some scrub land where hill gum and stringybark grows, and they should protect the young trees by clearing all undergrowth and removing the inferior trees, as a protection against fires and to promote growth of good timber. In about twenty years the present young trees would probably be large enough to cut. The drawbacks to this course are that all the scrub land is held on lease, and the lessee might lose the land and all the timber so conserved, and there is nothing to prevent anyone holding a timber licence from cutting down those trees. The red gum, which grows on swampy lands, will generally spring up thickly if the land is ploughed, especially if there are old trees about; but, in order to have them grow straight, they must be protected from stock for some time. Possibly the Scotch pine, mentioned by the Conservator of Forests in the *Journal of Agriculture and Industry* for June, 1898, would thrive on the sandy lands of the district where there is a well-drained subsoil. Possibly also the Norway spruce would thrive on the flats. Mr. Gill says the finest forests of this tree are on the shores of the Baltic, where the soil consists of a thin stratum of black peaty soil resting on a bed of sand, the whole of which is under water a great part of every winter. Such conditions prevail here, and the Norway spruce should be tried, as it produces the best of white deal, but protection must be afforded to those who plant or conserve trees.

Willunga, September 2.

Present—Messrs. W. J. Blacker (Chairman), Thos. Atkinson, W. J. Binney, T. Pengilly, J. A. Jacobs, J. Allen, J. Binney, J. Valentine, C. Bray (Hon. Sec.), and Dr. Counter.

EXHIBIT.—Mr. Valentine tabled wheat plant 4ft. 6in. high, from seed sown April 4.

BAGS OF WHEAT.—Dr. Counter initiated a discussion upon this subject, and contended that a 2bush. bag is quite large enough, and members agreed with him.

WOOL-CLASSING.—Mr. Blacker spoke upon the desirableness of teaching farmers—especially young farmers—how to sort or classify wools, and members were agreed that it would be advantageous to establish a class for this purpose.

Belair, September 11.

Present—Messrs. W. O. Nootnagel (Chairman), C. Downer, W. J. Bartlett, H. Halstead, John Halstead, and G. R. Laffer (Hon. Sec.).

STRAWBERRY CULTURE.—The Hon. Secretary read the following paper:—

In order to grow strawberries successfully it is necessary to thoroughly prepare the land. The system adopted by me for some time is to break the land up about October or November with a grubber, and to work it thoroughly with a cultivator through the summer. The breaking should not be less than 1ft. deep, but I prefer 15in. to 18in. After the first rain, which will penetrate the newly-broken land very quickly, it should be dug over with a fork, when it will be in the best possible condition for planting as soon as the plants are rooted. When planting I run a line and sow a fair dressing of superphosphate and bonedust mixed in equal quantities, which is hoed in, and then the plants are put in. I plant with a trowel, which will be found very much superior to the dibber used by many, as the roots are better spread and there is no space left under the plants as there is with a dibber. The distance between plants is a matter of opinion, but I now always plant 30in. between rows, and from 14in. to 18in. in the row; some sorts require more space than others. These distances are for working with horse hoes; if it is intended to work all by hand the distance between rows can be reduced to 24in.

As our climate is hot and dry, it is not suited to the matted rows system advocated by Americans, so it cannot be advised to let any runners set, but keep them all cut off as the distances given is quite close enough for plants in South Australia.

I think I can safely say that all strawberries grown in quantities in South Australia are staminates, or perfect bloomers, so that it is not so necessary to mix them as it would be if pistillate varieties were grown, such as Crescent and many other American varieties. It might be said that the Margaret, Edith, Sir Joseph Paxton, Red Chilian, and Duc de Malakoff are the only sorts grown extensively in South Australia, especially the first three named.

The Margaret is our great market berry, a very heavy bearer of large, good-colored fruit, and, although a perfect bloomer, does not fertilise itself well early in the season, and for that reason is now intermixed with the Edith, one row of the latter to every eight rows of Margaret. The great advantage of planting these two sorts consists in the fact that they bloom together, and the Edith is really an earlier maturing berry than the Margaret; but when the latter is pollenised by the Edith they ripen simultaneously, and the berries are of fine, perfect shape and good color, but growers must not expect to get heavier crops by mixing; they will find that those Margarets mixed with Edith will have their crop off some days before those unmixed, which is a great advantage, as the season can be prolonged by having some mixed and some unmixed. Imperfect fertilisation is the cause of crinkled, misshapen berries, known to growers as cripples, early in the season.

Of the first sorts named three are fairly healthy, Margaret, Edith, and Chilian, although the Edith is subject to mildew, while the Malakoff and Sir Joseph Paxton rust badly, especially the latter; the leaves are always badly diseased, which is one great reason why they cannot be depended upon for a good crop. Given healthy conditions they are splendid croppers, and certainly one of the best colored and flavored varieties we possess, besides being the best carrier. It will be found that Bordeaux mixture will assist in getting a crop, and I have had good results for mildew with sulphur, which can be applied when the young fruit is on the plant. When too late to apply Bordeaux, apply sulphur on a damp morning; have the sulphur in a bag, and give it a shake over every plant. While speaking of diseases, I may say that the small white grub has done a lot of damage to plants, especially in Upper Sturt; they eat the roots of the plant, and of course it dies. I think the best remedy is to keep working the land without crops; ducks would be of great assistance; grubby land should certainly not be replanted for, say, three years. All beds should be kept free from weeds, and thoroughly mulched to keep the fruit clean; I use seaweed, but anything will do—leaves or straw if free from weed seed. I have at the present time many other sorts under trial, some of which give great promise. Arthur is a very fine fruit of good quality, but I have not tested it sufficiently to say how it will bear, although it promises fair; Royal Sovereign, a first quality variety of fair size, but leaf rusts badly; Sharpless, a very healthy, large-leafed plant—fruit bright dark red and very firm, and appears to bear well; besides Laxton's Sensation, Monarch, and Noble, all very healthy plants and strong growers; Mikado, a New Zealand seedling, very similar to Surprise; Crescent, one of the heaviest bearers in the world; Captain, a fine bright fruit, similar to Paxton; E. F. Baron also promises well, besides some others. I find the best time to manure old plants is as soon as the first rain comes, so that the ground around the plants can be hoed. I use super. and bonedust, half of each. Do not cultivate deeply near the plants after the end of June, as those small white roots produce the fruit, and if damaged will interfere with the crop, and certainly do not dig late in the season between the plants, as it is likely to do far more harm than good.

Now, a few notes on blossoms may not be out of place. Staminates (perfect blossoms) contain stamens (male organs) as well as pistils (female). Perfect bloomers can easily be told from pistillate by the long stamens with yellow pollen standing in a row around the young berry while yet in bloom; pistillate varieties do not contain this. Pistillate sorts usually are the heavier croppers when properly pollenated by perfect bloomers, say one row of the latter to four or five of the former, but if not mixed properly will give very poor results. It is also imperative that both sorts should bloom at the same time.

Woodside, August 28.

Present—Messrs. R. Caldwell, M.P. (Chairman), C. W. Fowler, A. Lorimer, F. W. Drögemüller, J. H. Snell, J. Cuthbertson, J. C. Pfeiffer, N. Schröeder, A. S. Hughes, R. P. Keddle, and G. F. Lauterbach (Hon. Sec.).

Cow Fodders.—Mr. A. S. Hughes recommended, as good fodder for cows, Jersey Tree Kale, mustard, rape, and turnips. Tree Kale grows rapidly and luxuriantly in spring, and comes in when other green fodder is very scarce. It is wholesome, but the roots take such a hold on the soil that the stumps are very difficult to get out. Rape grows well, even in poor land, yields well, and produces a good deal of milk. Rape and kale should always be fed directly after milking—if fed before, the milk will be tainted. Great care should be taken not to allow any leaves to remain about the yard or shed, as it taints the milk if too near. Rape, which belongs to the Cruciferæ, to some extent collects nitrogen, after the fashion of the clovers, peas, and other Leguminosæ, and this makes rape beneficial to a succeeding cereal crop He did not advise the cultivation of turnips for fodder, as it involved too much labor, and has not the nutritive value of rape or kale. Mustard should only be used in conjunction with rape. Neither rape, kale, nor turnips will make good ensilage. [This is a big mistake. They all make excellent ensilage if placed in alternate layers of 1ft. thick, with straw or straw chaffed.—Gen. Sec.] Mr. Cuthbertson contended that it is not advisable to feed milch cows with any of the plants named, either before or after milking, as they are liable to impart a taint to their milk. He recommended bran and chaff, and barley and rye for green feed. Members generally agreed that some salt should be given to cows.

Stansbury, September 2.

Present—Messrs. Alex. Anderson (Chairman), J. Antonio, G. Jones, J. Henderson, P. Anderson, J. Sherriff, H. C. Pitt, C. Faulkner, P. Cornish, Geo. Sherriff (Hon. Sec.), and one visitor.

Bird Protection.—Members discussed the provisions of a Bill now before Parliament for the protection of birds, which includes a great many which are either known or reputed to be destructive to horticultural and other products, and which they consider ought not to be protected. This matter, affecting all cultivators of the soil, should be seriously considered by all Branches of the Bureau, as well as by others.

Season and Crops.—Mr. P. Anderson said that, notwithstanding the dry season, his orchard never before gave better promise of a good yield. The cereal crops look fairly well considering the very dry season, and hay crops are certain to be light.

Richman's Creek, August 21.

Present—Messrs. W. Freebairn (Chairman), J. M. Kelly, A. Knauerhase, A. Nicholson, J. J. Searle, M. Hender, J. McSkimming, P. J. O'Donoghue, W. J. Wright, and J. McColl (Hon. Sec.).

Conservation and Storage of Fodder.—M. Mattner sent a paper on this subject. The following is a very short abstract:—

> Many farmers, after twenty years' residence here, are no better off than they were at first, owing to droughts, and it is probable that another twenty years more will not improve the position of some of them unless their methods are changed. Seasons of plenty are not so frequent as seasons of scarcity and drought; but farmers should try to take example from the action adopted by Joseph in the time of Pharaoh, and make ample provision during the periods of plenty against the times of scarcity. "We get a few good seasons, and there are thousands of tons of fodder left lying to waste. We increase the number of our stock; improve our dairy herds by disposing of all inferior cows, and breeding from the best; then we write to our friends in the south, telling them what splendid times we are having, making money like anything. Then the next season sets in dry, with very little feed; the following one is also dry, with less feed; thus we find we have too many stock, and have to dispose of them for probably one-third of their value, or lose them through starvation." His idea was that they should not keep too many animals, and whenever there is a good season with plenty of herbage, cut, stack, or ensile as much as possible. They should always have enough fodder on hand to last three dry seasons. When there is a good crop of wheat, not too much shonld be cut for hay, but all the wheat chaff should be saved and kept perfectly dry by covering with straw. Where land is flooded occasionally it is usually covered with a dense growth of wild clover, geranium, &c., and this should be cleared from all rubbish, then cut, dried, and stacked, and finally covered with a few loads of straw. Stock will prefer this even to good wheaten hay.

The Chairman said that if the centre of the stack is kept well up, it will keep the rain out better. Mr. Knauerhase always saved his chaff, and had found it very useful when feed was scarce. Mr. O'Donohue thought if stacks were built in the paddocks, and fenced round, the stock would find shelter as well as food.

Rainfall.—For July, Mr. W. Freebairn, 0·76in.; Messrs. A. and J. McColl, 0·85in.

Orroroo, September 6.

Present—Messrs. J. Moody (Chairman), R. Coulter, M. Oppermann, W. S. Lillicrapp, H. C. Ives, E. Copley, J. Scriven, and T. H. P. Tapscott (Hon. Sec.).

Stacking Bags of Wheat.—The Hon. Secretary directed attention to the damage done to bags of wheat in stack by mice. The bags are generally laid flat on the ground, which gives the vermin excellent harbor; but he found that they do very little damage if the bags are stacked on end, with plenty of paper between the bags, as the mice are very fond of paper.

Mice and Empty Bags.—The Hon. Secretary said mice cause much trouble through eating grain bags when laid in heaps in barns, &c. To avoid this, some farmers put their empty bags into other bags, and hang them up on crossbeams; others hang them across wires or beams in the shed or barn; but neither plan will protect the bags against mice. The best plan he had found was to put his bags into large zinc-lined cases, fitted with good hinges. These, when not filled with bags, are very useful for holding bran and pollard for the horses.

Lyrup, August 22 and September 5.

Present—Messrs. F. Nolan (Chairman), D. J. Tree, W. H. Walling, A. Pomroy, O. Klemm, J. Tyc, A. Menzies, J. Sykes, D. Thayne, W. Healy, W. W. Wilson (Hon. Sec.), and three visitors. A. Wenner and P. Brown attended only the latter meeting.

Exhibits.—Mr. A. Pomeroy tabled four self-sown parsnips, 6¾lbs. weight, grown in stiff soil. They came up in January last: had very little water or attention.

Bleeding of Vines.—The Hon. Secretary was informed that the "bleeding" of late-pruned vines is rather beneficial than otherwise. [This is not correct advice. A little bleeding may not greatly injure the vines, but it is by no means "beneficial," and, if continued, will be very injurious.—Gen. Sec.]

Meadows, September 4.

Present—Messrs. J. Catt (Chairman), G. Ellis, D. Tester, W. J. Stone, T. B. Brooks, W. Nicolle, W. Pearson (Acting Hon. Sec.), and one visitor.

Domestic Dogs and Sheep.—After discussion, members agreed that much damage would be prevented if dogs were chained up at night.

Weeds on Garden Paths.—Mr. Nicolle tabled the following recipe:—Boil 1lb. arsenic and 2lbs. washing soda in 1gall. of water for half an hour, stirring all the time till dissolved. Half a pint of this solution should be mixed with each gallon of water, and sprinkled by a watering pot.

Calca, September 2.

Present—Messrs. A. B. Smith (Chairman), J. Bowman, T. P. Cash, A. Plush, R. H. Squire, and D. P. Thomas (Hon. Sec.).

Closing the Branch.—After reading a quantity of correspondence from Farmers' Union, Sack Exchange, bookbinders' firms, Central Bureau, Colton Branch, manure merchants, steamship companies, and several others, it was resolved—"That, as members and the public generally take but little interest in the Branch, it shall be closed."

Narridy, August 21.

Present—Messrs. A. Bairstow (Chairman), H. Nicholls, Jas. Nicholson, E. Smart, W. J. Martin, A. McDonald, R. Satchell, and Jas. Darley (Hon. Sec.).

Officers.—The Chairman and Hon. Secretary were thanked for past services. Mr. Jas. Darley was re-elected Hon. Secretary and Mr. A. McDonald was elected Chairman.

Meningie, September 9.

Present—Messrs. M. Linn (Chairman), J. Williams, W. Tiller, R. M. Scott, C. J. Shipway, S. F. Robinson, and H. B. Hacket (Hon. Sec.).

Bags as Wheat.—Members favor the old plan of grain buyers supplying bags free to farmers, charging for those not returned, or allowing value for bags when not supplied.

Cherry Gardens, September 12.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, C. Hicks, G. Brumby, and C. Ricks (Hon. Sec.).

Crops.—Since the rains all crops have made good progress.

Manure for Peas.—Mr. J. Lewis used 3cwt. per acre of Thomas phosphate for peas, and has a splendid looking crop.

Pruning.—Members illustrated, by means of branches of fruit trees, their ideas as to the proper methods of pruning each variety.

Question Box.—Mr. Gibbins presented a question box to the Branch, which will be placed near the local post office.

Mallala, September 7.

Present—Messrs. H. B. Moody (Chairman), G. Marshman, S. Temby, A. F. Wilson, F. M. Worden, M. H. East, J. Jenkins, A. Moody, W. Temby, B. Cowan, A. M. Wilcox, and W. B. Stephenson (Hon. Sec.).

Bag Worms.—Mr. S. Temby tabled some insects which were denuding sugar gums. [They prove to be bag worms, called native silkworms, which in some places multiply very rapidly, and defoliate eucalypts—especially young sugar gums. They can be destroyed by spraying the trees with arsenite of lime or with Paris green.—Gen. Sec.]

Crops.—Cereal crops have improved very greatly since the rainfall.

Summer Fodder.—Mr. F. M. Worden read a paper to the following effect:—

Previous to making a first attempt in growing sorghum, in 1886, a friend gave a glowing account of his own crop the year before It came up without rain, grew well, and was fed off several times with sheep. It was grown on sandy soil, which is always more likely to give good results than are the heavy stiff soils. We then secured some seed, prepared the land by ploughing and working it down fine (it was very hard and dry), then put on six horses with a 9-tined scarifier to loosen the subsoil, sowed the seed, and did not get enough fodder to feed a small rabbit. About two years after we again sowed five acres, and in March had a crop so tall that the cattle could not be seen in it. This was due to heavy floods during February—such do not occur often. For the past seven or eight years, with one exception, our summer crops have given very poor results. He had tried several varieties of sorghums, thousand-headed kale, beets, mangolds, and rape, and have generally got a little, but not enough to pay for the labor and outlay. He was forced to the conclusion that it is not possible to grow green summer fodder on the stiff clay soils without irrigation. It will pay to grow a little near the farm sheds for poultry to help themselves from. The fowls ate all the green fodder for several years. He was of the opinion that, on such stiff clay soils, it would give much better results to grow fodder during the winter and spring months, and convert it into silage or hay. The land should be prepared about June, or early in July, so that it will readily take in the rain. Those who have good wells of water should grow a little lucern to give to the cattle once or twice a week, if not oftener, to keep them healthy. Tree-lucern (Cytisus proliferus), a branch of which is now produced, is recommended as a good fodder, but he thought it too woody. [Horses and cattle eat only the leaves and tender shoots, and are never injured by it.—GEN. SEC.] He thought ensilage was the most promising way of providing succulent fodder for stock during autumn and early winter; and they ought to cut some of the best of the crop for that purpose, as well as the weeds and stuff that could not be reached by the binder or the stripper. It would be useless to put in weeds, &c., that cattle or other stock would not eat when growing in the field. If the silage were cut a week or ten days before cutting the hay crop, it would get the binder in tune for the hay crop. If, during spring, the wild oats get ahead of the power of the stock to keep them down, bring out the stripper and take off the seed. This, if placed in small heaps, so that they will not heat, will be greedily eaten by the live stock. Straw from the header and thrasher, and the wheat-hulls, or "cocky chaff," have proved of great service to many farmers, especially when supplemented with a little bran and pollard, or boiled wheat or oats. He had heard of a farmer who cut some of his wheat crops green and stacked it in layers with straw, and the resulting hay was so even in color and appearance that one could not tell the one from the other. He thought every one should grow about 10 per cent. of his crop in oats, and considered Cape oats the best all-round variety, and that the straw is far superior to wheat straw for feeding purposes; the grain is excellent and the chaff valuable.

Kadina, September 7.

Present—Messrs. D. Kennedy (in chair), Peter Roach, D. Taylor, M. Quinn, J. Ward, H. Johnson, and J. W. Taylor (Hon. Sec.).

STANDARD AVERAGE BUSHEL OF WHEAT.—The Hon Secretary read a lengthy paper. The following is the substance:—

He did not hold with the opinion often expressed that the standard average weight of each season's crop of wheat was fixed too high. The higher it is fixed the better will appear the quality of our wheat in the world's market. Our wheat is purchased chiefly to mix with that of other countries where grain is of inferior quality to ours; therefore the higher our standard is kept the more value will it command. It had been said that South Australian wheat was the best in the world, and also the dirtiest, and to a great extent our farmers were culpable in this respect. The presence of oats, drake, &c., in our wheat was the cause of the fall in value. Years ago our wheat brought 2s. per quarter more than that of any other co'ony. The buyer is to be blamed for taking some of the samples he does take. As a wheatbuyers' agent of ten years' experience he had found that if a farmer were docked 4d. per bushel (even if his wheat were fully 6d. per bushel inferior quality), the agent is declared to be the biggest robber on earth. On the other hand, if the sample is really prime, and you give him ¼d. or ½d. per bushel extra, you are the best man he ever met. Mr. Goodall, of Paskeville Branch, advocated that the standard should be permanently fixed at, say, 63lbs.; then any wheat weighing over should receive, say, ½d. per bushel for each pound weight over 63lbs., and any under standard should receive less in proportion. This would induce farmers to clean their wheat better. The buyers are blamable for failing to dock wheat that is light through being badly cleaned. Bunted or smutty wheat is very light when run only once through the winnower; but he had known such to be raised to 66lbs. when put through the winnower two or three times. Sometimes the piecework men are blamed for the lightness of the sample, but when they are told there will be "about 3,000 bags to run through only once at 5d. per bag" they take the contract at 5d., and cannot reasonably be expected to run it through more than once. He did not think wheat could be bought advantageously under the system advocated by Mr. Goodall, as it would involve too much trouble in measuring, weighing, and grading at the station. It has been often remarked that the farmer with dirty wheat gets as good a price as another with clean wheat. Now, the instructions from the head offices read something like this "We allow you to give — per bushel at your station for prime samples. Great care must be used, and any inferior samples must be submitted to this office for valuation." In the face of this the wheatbuyers' agent allows Mr. Brown or Mr, Jones to deliver a load or so of poor samples, and do not wish to be hard, because we had his good wheat. Still, it should be remembered that we paid him a good price for his good wheat, and then we pay him the good price for his bad wheat. He suggested that the corn trade section of the Chamber of Commerce should appoint a thoroughly practical man for each delivery station, who should sample every load of wheat sent in (no matter for whom intended to be delivered), and he should give a certificate which should be binding on each agent, something like this—'Prime F.A.Q., 1d. off, 2d. off," and so on. The agent purchasing would be required to send on these certificates each day to the head office with his statements. Then the merchants would know exactly what quality of wheat they had at each station, and could fix their prices accordingly, instead of, as at present, being compelled to allow themselves a margin for possible deficiencies in quality.

The Chairman had always found it most advantageous to keep his rubbishy grain at home to feed to his stock. It was cheaper than anything he could buy. Mr. D. Taylor did not think that the appointment of an inspector by the corn trade section would have any more effect than would legislation in making better husbandmen.

Caltowie, August 28.

Present—Messrs. J. G. Lehmann (Chairman), J. Neate, J. Potter, D. Wilson, G. Petatz, A. McCallum, P. O'Loughlin, L. Graham, J. A. Leahy, J. Noonan, and A. McDonald (Hon. Sec.).

CATTLE DISEASES.—Mr. Kerr mentioned that an apparently healthy heifer was suddenly seized with choking, and he had to kill her. Upon a careful examination afterwards he could find nothing that seemed to have caused the trouble. Mr. Graham also had a beast which he thought was affected with tetanus, and he had killed it. Mr. McDonald has a cow which has developed abnormally long hoofs during the past few months, so that it is with difficulty she can get about. Some members thought this is owing to the soft nature of the soil, others considered it due to fever. [Mr. Kerr's cow was perhaps affected with paralysis, and this may have been due to the indigestible nature of her food, perhaps some months ago; but in the absence of fuller information it is not possible to decide. Mr. McDonald should cut back the abnormal growth, and if there is any bad smell, dress the hoofs with carbolic wash.—GEN. SEC.].

Millicent, September 7.

Present—Messrs. R. Campbell (Chairman), L. Oberlander, H. Hart, S. J. Stuckey, H. Holzgrefe, H. A. Stewart, B. Varcoe, H. Warland, G. Mutton, W. J. Whennen, and F. J. Harris (Hon. Sec.).

RAINFALL.—August—Millicent, 1·32in.; Mount McIntyre, 1·75in.

"FOXES."—Mr. H. A. Stewart read a paper on "Foxes," descriptive of the nature and habits of the animal, which, in this temperate climate, multiply so rapidly as to have become a pest. He advocated the cessation of the bonus, which had proved as ineffective in exterminating or repressing the foxes as it had been in respect to the kangaroos, rabbits, sparrows, &c., and suggested the provision of strychnine at cost price to private individuals who would undertake to employ it for destruction of this pest. Members thought that district councils should decide upon a uniform scalp bonus, if it were given at all, as otherwise the council which gave the largest bonus would be called upon to pay for the majority of scalps. The consensus of opinion was against the payment of bonuses, as it had been noted that thousands of pounds had been paid in turn for destruction of sparrows, kangaroos, and rabbits, without beneficial results, and even now some station owners forbade destruction of foxes, because they destroy rabbits.

STRAY RAMS.—Mr. Holzgrefe called attention to the reprehensible practice of some sheepowners in allowing rams to roam the country at large, thus causing damage and loss to other owners young flocks.

CHECK ON ROWDY SHEEP DOGS.—The Hon. Secretary directed attention to a device for checking dogs which are hard on sheep when working, viz., to put a piece of wire through the nose, as a bull is ringed, leaving enough wire to overlap about half an inch. This will catch in the wool and damp his ardor.

Stimulant for Lemon Trees.—Mr. R. Campbell said he had been told that by the liberal use of sulphate of iron for lemon trees in Victoria their growth had been twice as much as others that were not so treated.

Plant Labels.—Mr. Hart uses hardwood, painted white, and writes the name with a hard pencil whilst the paint is wet. This will be legible as long as the paint lasts. Bluestone added to ordinary ink makes a permanent record on zinc labels.

Seed Wheat.—The Chairman had proved that 96 per cent. of hand-cleaned wheat will germinate, whilst only 36 per cent. of grain from the steam thrasher would grow.

Maitland, September 2.

Present—Messrs. H. R. Wundersitz (Chairman), A. Janett, W. Wilson, H. Bawden, T. Bowman, J. Smith, J. Kelly, and C. W. Wood (Hon. Sec.).

Apple Trees Destroyed.—Mr. Wundersitz tabled root of apple tree, the bark of which had been destroyed by some grub or worm. Many trees, old and young, have already been killed by this agency. [No worm or insect was sent to me, but only a piece of root, the bark of which was eaten away almost completely. Of course it was impossible to tell what it was that ate the bark. —Gen. Sec.]

By-products of the Farm.—Mr. Wundersitz strongly recommended that cabbages, cauliflowers, &c., should be planted early. Rape should be sown for early cooking purposes. Potatoes will often do well when planted in March, and can be harvested in the early part of winter. With a little care and trouble, vegetables can be had all the year in most parts of this district. If carrots and beets are sown late they will not bolt to seed, and then if covered with mulch they will start to grow with the first rains, and will be tender and of large size in the early part of winter.

Finniss, September 4.

Present—Messrs. T. Collett (Chairman), J. Chibnall, W. W. Heath, S. Eagle, P. Gooding, R. J. Ness, A. E. Henley, and S. Collett (Hon. Sec.).

Best Wheats for District.—After much discussion, it was agreed that the following are the best wheats to grow in this locality, having regard to different periods of ripening :—Steinwedel, first ; Acme, Purple Straw, second ; Tuscan, third.

Malting Barley.—Mr. Chibnall read a paper on "Growing Malting Barley."

After several years' experience in growing malting barley, he thought some hints on the subject might be acceptable. Three kinds are usually grown, and Chevalier finds the most favor with mâltsters ; Scotch and Duckbill are the other sorts. A good sandy soil is generally admitted to be the best for growing barley ; but almost any soil will give a good sample if there is a good rainfall. Barley requires more moisture than wheat does to bring it to perfection, as it is not so deeply-rooting a plant.

The quality of barley for malting depends a good deal on the soil. That produced on a sandy soil has a thicker skin and darker color than that grown on a stiff red soil. Barley grown on stiff red soil has a much brighter color. A black soil generally produces a fine sample, but it is not considered good for malting though rich for feeding purposes.

It is better to sow with the drill than to broadcast the seed, as it is better rooted and withstands dry weather much better. About 40lbs. seed per acre is enough, and if hand-thrashed a much smaller quantity will suffice.

The most important thing is harvesting. The barley can be got in with an ordinary stripper if the concave is taken away and the beaters are moved as far forward as possible without touching the comb. The edges of the beaters must be quite square, as a round edge will both skin and crack the grain and make it of no value for malting purposes. If properly stripped, the grain should come in with the beard on. Next spread the barley on a good hard floor and tread it with horses until the beards are broken up small so the lot will run easily through the winnower. Rolling with the ordinary land roller will take off the beards, but not so satisfactorily as with horses. Winnow once and put away in bags in a cool place until the maltster wants it, then winnow again. This improves the weight and color of the barley, and removes any odour which sometimes attaches to grain bagged to soon after stripping.

Tatiara, August 26.

Present—Messrs. T. Hanlon (Chairman), T. Hall, R. Scown, E. Prescott, W. Montague, F. H. W. Wiese, J. Green, H. Killmier, F. Smith, and W. E. Fisher (Hon. Sec.).

Attendance.—The Hon. Secretary read a list of attendances of members since last annual meeting, and members present were of the opinion that the attendance of some of them was not at all satisfactory. It would be better to carry on business with fewer members if the others would not attend, unless some active and diligent practical men could be put in their places. [Quite right. If members do not attend to their duties remove their names from the roll, and nominate some brainy, practical, and zealous men in their places —Gen. Sec.]

The Horse.—Mr. Killmier read a very lengthy paper on "The Draught Horse."

Onetree Hill, August 29.

Present—Messrs. J. Bowman (Chairman), G. Bowman, W. Keily, F. Ifould, H. H. Blackham, P. Taylor, F. Barritt, A. Thomas, J. Clucas (Hon. Sec.), and a number of visitors.

Dairy Lecture.—Mr. G. S. Thomson, Government Dairy Instructor gave a very lengthy lecture on dairy matters generally. The following is a digest of the same:—

For successful dairying regard must be had for the general contour of the country, as it is found that the pasture grown on hill slopes contains more albumen than that grown on the plains, and the Onetree Hill district in this respect is peculiarly suited for the industry. The difficulties resulting from protracted periods of drought and limited rainfall are not so severely felt in hilly country; the milk is richer, and its keeping qualities superior, and the butter of harder texture and finer aroma. As regarded various breeds of cattle the best of the Holstein or Friesian cows give the largest quantity of milk, according to American returns; next the dairy Shorthorn, the Ayrshire, the Guernsey, and the Alderney or Jersey. As to quality the Jersey came first, the Guernsey next, then the Ayrshire and Shorthorn, and last the Holstein. The milk of the last-named three is best adapted for cheese-making, the globules being small and the amount of casein proportionately large; whilst that of the Jersey and Guernsey give the best quality of butter, but the cheese made from it does not possess the same keeping properties. Force feeding of milking stock should be avoided, as it promotes the habit of grossness, which reduces the quality of the milk, and in this connection the ordinary Shorthorn and Holstein are more liable to pile on flesh than the others mentioned—particularly than the Jersey, which had no predisposition in this direction, and could always be relied upon as a milker. Judicious feeding should therefore be carefully observed. The points to be noticed in judging dairy cattle were next dealt with. The Ayrshire was an ideal animal with small head, long neck (fine and narrow at the nape), good width between the eyes, the withers sloping quickly, the front view of the animal presenting a wedge shape, the spine well defined, buttocks well apart with a good distance from the hookbone to the middle of the udder to allow ample development, and what is known as the milk vein large, extending well to the front, with ample aperture indicative of strong circulation and consequent generous supply of milk. A wide muzzle was usually regarded as a sign of good digestion. The Shorthorn showed greater uniform breadth, with well-sprung ribs, and less of the wedge shape; whilst the Jersey was similar in points to the Ayrshire, but finer throughout, more deer-like in appearance, and was more fragile and liable to disease, and, if kept pure, would gradually fall away in size. The crosses recommended for dairy purposes were Ayrshire and Shorthorn, and Jersey and Shorthorn; the dam to be Shorthorn in each instance in order to give the progeny in.

more fixed condition the qualities of the sire. The former cross had proved a great success in Victoria. The lecturer had tested the milk of a cow of this cross near Port Augusta, which had given 8 per cent. of butter fat, equal to 25lbs. of butter per week. But in crossing stock due regard must be had to the food supply of the district. Where there was an ample supply of good herbage the Shorthorn-Jersey could be relied upon, but where there was a scarcity it would be safer to trust the hardy Ayrshire. The black-polled Angus were of little use for the dairy, but were difficult to beat for the stall. As fodder, nothing was better than the natural pasture, which contained all the component parts for producing the best quality of milk; but as the native grasses flourished only during a short period of the year, ensilage was recommended. The use of dry feed alone jeopardised the health of cattle, and should be alternated or mixed with green stuff such as lucern, beetroot, sorghum, rape, cabbage, or mangolds, and where green fodder cannot be grown dairying should certainly not be attempted. Preference was given to lucern, which was an essentially leguminous food, but there was a danger in giving too much when damp, and if fed green it was liable to taint the butter; but this result could in a great measure be obviated by cutting a couple of hours before using. An abundance of dry fodder, which contained a maximum of solids, was always a desideratum, but even with an unlimited supply it would be necessary to feed occasionally with green stuff to promote digestion and prevent impaction. Beetroot should not be fed too freely, nor yet cabbage, especially the stems. The mangold was the best root food, and the leaves were eagerly consumed, but if fed in a green condition there was no danger of purging. Mangolds should not be taken out of the ground until full grown, with the taproot attached to prevent bleeding, and then left covered over for some considerable time before using. With proper cultivation mangolds were a most valuable crop. The best cake for cattle was copra, made from the cocoanut, and contained 13 per cent. of oil. For quality of milk the breed of the herd must be taken into account, the sire being the first consideration, and the feeding must be carefully attended to. Nervous cows should not be bred from, and it should be borne in mind that excitement in any shape militated against a normal supply of milk, and where practicable a change of paddock or locality as well of food was commendable. It frequently occurred that cattle tired of even the best food if given continuously. The milk should be taken from the four quarters uniformly, maintaining a fairly even balance, and thoroughly stripped. The last of the milk was the richest, and if the stripping were neglected a permanent injury was done, as the arrears were not made up in subsequent milkings. Cleanliness above all things should be observed both at the milking and in the dairy. The process of fermentation was fully gone into, with experimental references, and the rapid process of contamination explained. The milk of a newly-calved cow should not be used until quite five days after the calving. A practical test was to put a pan of such milk on the fire, and if it quickly formed a thick skin on the surface it must be condemned for domestic use. Even when sterilised, milk was exceedingly susceptible to the unwholesome influence of objectionable surroundings. The separator was recommended, as by its use a maximum of cream was obtained. The milk should be heated to a temperature of 90° Fahr., and in winter it might be increased. In summer it should be separated when taken from the cow, or otherwise to be kept in a cool place and separated without heating. The separator should be kept going at the maximum speed, as any relaxation means loss of cream. The machine should be thoroughly cleansed after each use. The ripening process of the cream, whereby the sugar is changed into an acid, should not be allowed to go beyond a certain limit. A simple test was by the taste; a sharp acid succeeded by a sweet taste indicated the proper conditions *vice versâ* showed that the cream was unripe, and pungency denoted a stage of decomposition. The proper temperature for churning was 58° Fahr., if higher a certain proportion of the butter was lost unless in very cold weather, when a slight increase of temperature might be found necessary. The cream should be kept in one receptacle and stirred at intervals before churning to ensure uniform ripening; otherwise a proportion of the butter will be lost. When the cream "breaks" a little cold water should be added to check fermentation, and then the churning should be slow and not continued after the granules had been sufficiently formed. Excessive churning gave the butter the consistency of paste, ruining its texture. The buttermilk should be run off, and the butter washed in the churn by changes of water until the presence of milk has disappeared. Too much handling has the same effect upon the butter that over-churning had. The flavor removed by the thorough washing would return in two or three days. Streakiness in the butter was caused by careless salting. It was desirable that the last water used in the washing should be a weak brine, in which the butter should remain for some time By this plan better flavor and color would be obtained and rancidity in any part obviated. The presence of specks was evidence that the cream had not been stirred at intervals as recommended, and the presence of buttermilk would result in rancidity in a few days. Good butter would stand the test of pressure without shedding tears, either milky or watery, and if the ordinary shaped pound of butter were cut half through across the middle, and then broken into halves the breakage would show a granular rather than a soapy texture; indeed, inferior butter would not break at all. The use of preservatives was condemned as containing boracic acid. The unsatisfactory system of judging butter which had heretofore obtained at our agricultural shows was criticised, and it was probable that in the future a system of judging by points would be adopted, whereby each exhibitor would be able to ascertain wherein lay the merits or demerits of his exhibit; besides, such a system would possess an educational significance with which every public exhibition should be invested. To keep pace with the Danes and other butter-making communities the time might arrive when the best cultures would be scientifically produced and systematically distributed amongst the dairying centres in our own province. The process of cheese-making was fully gone into and explained.

At the close of the lecture information was elicited relative to various diseases in cattle, such as tuberculosis, which was more prevalent than generally supposed, actinomycosis or lumpy jaw, and milk fever. Localised tuberculosis might be innocuous, but in its generalised state it was highly dangerous as regards both milk and flesh. The symptoms of the disease were described. For milk fever he recommended Mr A. J. Murray's cure, published in the *Journal of Agriculture and Industry*, and Dr. Schmidt's injection; but the use of iodide of potassium by unskilled persons was not without risk.

A unanimous vote of thanks was accorded to Mr. Thomson.

Lipson, September 16.

Present—Messrs. S. F. Potter (Chairman), J. Wishart, G. Provis, C. Provis, J. McCallum R. B. Haldane, W. F. Darling, H. Brougham, Geo. Carr, J. Brown, and two visitors.

New Implements.—A long discussion took place on the recent trial of the Spalding Robbins disc plough. Members were of opinion that this plough would be of special service for draining land, making ditches, and breaking up "yacka" land. Members were also well pleased with the work done by the Massey-Harris cultivator, which was considered to be a very useful implement for fallow land.

Ensilage.—Mr. G. Provis asked for information on this subject. Members advised that the stuff should be allowed to lie for a few hours after being cut, then put in the pit. When the pit is full, weight it down and cover it to protect it.

Hay-making.—In reply to question, members considered that hay crops should be cut when the blossom has fallen. Brown Tuscan and Purple Straw were most favored for hay.

Cradock, September 16.

Present—Messrs. R. Ruddock (Chairman), P. O'Dea, J. H. Iredell, T. Marsh, J. Turner, W. Haggerty, T. Fitzgerald, J. H. Lindo (Hon. Sec.), and four visitors.

Building Stacks.—In discussion the Chairman said he had had experience in stack-building in England, where as much as 10 tons per acre is sometimes cut for hay. He had also cut and stacked heavy crops at Clare, in South Australia. Stacks should be built on hard ground—never on dunnage—then mice would not burrow under them. Mice often destroyed a stack when it was not properly built. Stacks should be of small size at the bottom, and swell out a lot up to the eaves; then they should be carried up very stiff—nearly straight. The great mistake was often made of building stacks too large at the bottom. From start to finish the centre should be kept very full and high, so that the layers form arches; then the stack will settle down so hard that the mice cannot penetrate it. He had built a stock on hard, gravelly soil which kept free from mice for six years, although mice were numerous. Professional stackbuilders at home do not use a fork, but keep the men in the middle, filling it up and treading it firm, whilst they lay the hay round the outside with their hands, leaving it loose, so that in settling the outside dropped downwards. Instead of thatching he recommended to stick in rows of pegs, then lay straw loosely on and press firmly down. No lacing from peg to peg is required. A ton of iron and some cheap battens make a convenient and inexpensive roof for stacks. A visitor said it was a good plan, in roofing with straw, to put a row of pegs on the eaves. press the straw in firmly around them, and run a wire along the row of pegs, weighting it at each end. Mr. T. Fitzgerald said that with straw cut with a binder a good thatcher could thatch 100 tons of hay in two days. Mr. M. Fitzgerald said a scaffold was better than a pitch-hole for topping a stack; and Mr. Turner thought a wagon better still, as one could move it around the stack to suit the wind and prevent the stack getting pressed more on one side than the other. Another visitor said he had seen 1,400 tons of straw stacked at one place, and thatched with straw. He thought binder hay the least expensive and most valuable, because hay and straw of wheat cut with the binder made good feed for stock. The Chairman thought binders cut too high. There was a lot of waste in short crops. Mr. Ward said some binders cut low, but were not so durable as those which cut higher. Mr. T. Fitzgerald thought it would be better if the fingers of binders did not slope downwards so much.

Wilmington, August 21.

Present—Messrs. J. Zimmermann (Chairman), J. Hutchens, J. Schuppan, W. Slee, J. Lauterbach, A. Maslin, T. H. Harris, H. Noll, and J. McLeod (Hon. Sec.)

Ensilage.—Mr. Hutchens read an interesting paper on this subject.

Officers.—Mr. Hutchens was appointed Chairman for the ensuing year.

Pickling Wheat.—Members wished to know whether wheat could be killed by pickling, and, if so, what quantity of bluestone would be injurious. [Bluestone pickle will kill the germ, but what strength would be required I do not know. It will partly depend upon the time the grain is in the pickle. Four ounces of bluestone to the bag is sufficient, and anything above 8ozs. would be very likely to injure the grain.—Gen. Sec.]

Forest Range, August 31.

Present—Messrs. J. Vicars (Chairman), J. Green, R. Townsend, H. Waters, R. Hackett, J. Sharpe, W. Cherryman, O. Kummnick, S. Collins, J. Caldwell (Hon. Sec.), and two visitors.

Annual Meeting.—The Hon. Secretary read a review of the work of the Branch during the past year. Messrs. J. Vicars, J. Green, and J. Caldwell were re-elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Naracoorte, September 9.

Present—Messrs. S. Schinckel (Chairman), H. Buck, B. S. Roach, Job Wynes, D. McInnes, E. C. Bates, A. Johnstone, and G. Greenham (Hon. Sec.).

Commercial Fertilisers.—Mr. Bates thought bonedust is a very slow fertiliser. The caves ought to be opened again for the supply of guano. The Chairman did not think there was any guano left in the caves. He had fertilised a crop of barley with bonedust, and obtained a heavy yield. The same land previously without manure had yielded a poor crop. [Very finely-ground bonedust or other solid manurial substance will act far more quickly than that which is coarse and lumpy.—Gen. Sec.].

AGRICULTURAL SHOWS.—A lengthy discussion took place on Mr. Bates's paper read at last meeting on this subject. A misprint in the paper occurred. "Vested rights can't be adjusted" should read "vested rights can be adjusted." Mr. Johnstone had always advocated one large agricultural show for the South-East in place of several small ones. It should be held alternately in the various centres of population and production, and would attract competition from a wider radius. Such a show could be run at half the cost of the present numerous shows. The Chairman said three societies in North-West Wimmera had combined, but after holding one show the movement collapsed. [In Great Britain the Royal Agricultural Society and the Highland Agricultural Society hold circuit shows in various towns, usually with great success.—GEN. SEC.] In the South-East there were difficulties in the way. For instance, at Mount Gambier they would be able to make room for display of all exhibits and find room for all the visitors, but could this be done at Naracoorte? After a deal more of discussion the debate was adjourned.

BLUESTONE TEST.—Mr. Roach demonstrated how to test the purity of sulphate of copper by placing a solution of it in a clear glass tube, then adding a portion of decoction of tea leaves, when the color changed to a brown or olive green. In another tube he placed a solution of sulphate of iron, and upon adding tea the solution became nearly black, and a cloudy precipitate quickly formed. [Full particulars of this test were given in August issue, page 90, Elbow Hill Branch.—GEN. SEC.].

TREATMENT OF SEED WHEAT.—Mr. Bates had been informed that seed wheat steeped in a liquid composed of water and fowl manure had shown excellent results. [It is a general practice with Chinese gardeners to soak their seeds in liquid manure for a short time before sowing.—GEN. SEC.].

EXPERIMENTAL FARMS.—Some members thought that experiment stations should be established in various parts of the colony, where analyses of soils and experiments of all kinds should be conducted by Government officials, who should also give lectures in the neighborhood: Other members considered that each farmer should conduct experiments for himself, and communicate the results for the good of his fellow cultivators, as soils vary so much everywhere. The best analysis was practical analysis, and the best teacher was experience. It was a bad practice to crop the land year after year with the same crop. There should be rotation of crops.

Gladstone, September 2.

Present—Messrs. C. Gallasch (Chairman), E. Coe, J. Brayley, W. A. Wornum, B. Griffith, J. H. Rundle, J. Shephard, J. Tonkin, J. H. Sargent, C. R. Phillis, D. Gordon, J. Gallasch, and J. Milne (Hon. Sec.).

HAY.—Mr. C. R. Phillis read a paper on growing and preserving hay.

ORANGES.—The Chairman tabled some nice samples of oranges grown by himself.

Kapunda, September 2.

Present—Messrs. J. J. O'Sullivan (in chair), H. King, J. A. Schultz, G. Teagle, J. P. Orchard, J. H. Pascoe, W. Flavel, and T. Jeffs (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that the meetings during the past year had been very instructive. Papers upon "A Farmers' Union," "Three Best Varieties of Wheat," "Forestry," "Farmers' Relief Fund," and "Tuberculosis" had been read and discussed. Mr. B. R. Banyer, of the *Kapunda Herald*, gave an interesting paper on "Fertilisers," and Mr. G. S. Thomson delivered a lecture on "Dairying." The Branch held one meeting at Mr. Shannon's farm, and it is hoped that more meetings of this character will be held during the next year Twelve meetings were held during the year, the average attendance being nearly ten members. The officers were thanked for their services, and Mr. King was elected Chairman and Mr. T. Jeffs re-elected Hon. Secretary.

Pyap, September 20.

Present—Messrs. B. T. H. Cox (Chairman), C. Billett, J. Harrington, E. Robinson, H. Mills, J. Arnold, J. Bowes, W. C. Rodgers (Hon. Sec.), and one visitor.

Improvement of Stock.—Some discussion took place on the advisableness of the Government extending the movement for the improvement of stock by purchasing some pure-bred stallions for loan to the Branches. Members were of opinion that the class of horses bred in this district was susceptible of improvement. The clean-legged draught horse was considered the best for the district, owing to the sandy nature of the soil and to the fact that such a horse can be utilised satisfactorily in all branches of farm work.

Nantawarra, September 19.

Present—Messrs. E. J. Herbert (Chairman), R. Nicholls, A. F. Herbert, R. Uppill, S. Sleep, Jas. Nicholls, C. Belling, E. J. Pridham, T. Dixon (Hon. Sec.), and seven visitors.

Field Trial Society.—Delegates reported that efforts were being made to secure block of land near Paskeville for the Bureau Field Trial Society.

Fertilisers.—The Hon. Secretary reported that he and Mr. Nicholls had waited on the Commissioner of Crown Lands, asking that portion of the Salt Lake should be resumed, so that the local residents should be able to obtain portion of the deposits under the salt for use as fertilisers.

Balaklava, September 9.

Present—Messrs. P. Anderson (Chairman), J. Vivian, W. H. Thompson, A. W. Robinson, W. Smith, A. Hillebrand, and E. M. Sage (Hon. Sec.).

Sheep on Farms.—Mr. A. W. Robinson read a paper on "Sheep on Small Holdings."

There are many people who suppose that to keep sheep profitably a large area of country and a strong backing of capital is rquired, and that it is impossible on a small scale to depasture sheep profitably, He maintained, however, that sheep-farming can be carried on successfully on even 640-acre farms. It must be remembered that where small holdings exist they are generally close to the market, and the produce costs comparatively little for carriage compared with sheep raised on the large holdings in pastoral country. Every farmer with a reasonable acreage should keep sheep. They do away with the butcher's bill, assist in keeping down the weeds on the fallows, when, through press of work, one is unable to put on the teams; they improve the pasture more than any other stock when grazed judiciously, as they distribute the manure more evenly, eat weeds which other stock are apt to leave, and, by cropping the grass close, make it stool out better. He considered the most profitable sheep for small holders is that which yields the most wool and mutton. Fineness of wool must, to a large extent, be disregarded, as it is incompatible with weight of carcass; and, besides, the practice of running the sheep on the fallows results in dirty and discolored wool, and they could not compete for quality with the squatter. He would recommend cross-breeding, with the view to raising lambs for export, giving a good carcass and plenty of wool. Probably the best cross would be a Shropshire ram on a merino, or Lincoln-merino first cross ewe, the latter especially being a hardy mother with good udder. The lambs will be shapely, low set, thick, full of meat and quality, and will find a ready sale in the English market. The merino was not fit for export. They waste quickly and get feverish, the color of the meat is affected, and besides they are not so symmetrical—the hind legs being badly coupled and the back and loins poorly covered. The greatest of care must be exercised in driving, handling, and trucking lambs for export, as it takes very little to bruise the carcass, causing it to be rejected. The most desirable feature of the lambing is to have an even drop. This can be greatly assisted by having about one ram to each forty ewes, keeping the latter in strong store condition, taking care not to have them too fat, and when putting the rams in with the ewes remove the flock to the best feed procurable. It will be found that this has a marked effect on the percentage of the drop and the evenness of the birthday. Care must be exercised in tailing and castrating the lambs. There are two methods of opening the scrotum, both having their advocates. The method generally adopted is to slit the scrotum, for it is the quickest method, and the cut heals more quickly and is never likely to be attacked by flies. Care should be taken not to cut too deep, but only sufficient to allow the testicles to protrude far enough to be grasped by the teeth. The testicles should be drawn as cleanly as possible, and without any biting or breaking, and both should be taken together. The tail should be cut to about 2in. in length, and should not be pulled too vigorously, for it often happens that when this is done about ½in. of bone is left protruding further than the skin, and thus it heals slowly and and causes unnecessary pain. Lambs should not be castrated while over-heated, nor even late in the evening if the weather is cold and frosty. When weaning the lambs the ewes should be kept on a short allowance of feed for a few days to slacken off the flow of milk. He favored the keeping of ewes in preference to wethers, as the latter only gives one crop while the ewe gives two—her fleece and lamb.

Members agreed that the greatest mistake the beginner was likely to make was in keeping too many sheep. Mr. Anderson finds that the Shropshire-Merino cross matures more quickly than the pure Merino; his crossbreds are heavier than the Merino, though six to eight weeks younger. Pure Merino lambs dropped last August weighed when dressed 46lbs. to 50lbs., and the skins fetched 6s. each.

Angaston, September 23.

Present—Messrs. P. Salter (Chairman), P. Radford, M. Andrew, R. Player, J. Vaughan, W. Sibley, and E. S. Matthews (Hon. Sec.).

Curl-leaf.—Honorary Secretary tabled specimens of pear leaves from various gardens affected with a kind of curl-leaf. Members apprehended no serious results as they believe it will disappear in a short time.

Peach Aphis.—This pest has appeared in several orchards and various remedies have been tried, including sheep dips, which seem to have been the most effective. The Honorary Secretary had cleaned his trees by aid of the hose and water, and then placed a bucket of fresh wood ashes around the base of each tree with good results.

Fat Lambs for Export.—The Chairman strongly urged farmers to rear fat lambs for export to Great Britain. He had realised top prices for several years for those he had sent. The Merino ewe and Shropshire ram gave the best cross.

Port Elliot, September 23.

Present—Messrs. P. O. Hutchinson (Chairman), W. E. Hargreaves, H. Green, sen., H Pannell, J. McLeod, J. R. Coote, and E. Hill (Hon. Sec.).

Dairying.—The conditions attached to loan of Jersey bull by the Department of Agriculture were accepted, and a committee appointed to see that the animal was properly looked after and his services used judiciously.

Pigs.—Mr. Cook stated that his pigs were infested with insects similar to sheep tick. He was advised to use soft soap and tobacco water, or sheep dip.

Hindrances to Successful Farming.—Paper on this subject, read at Congress by Mr. J. W. Dall, was well discussed. Members generally considered the paper more applicable to the larger areas of the Northern farms than to the limited holdings in the South, but the importance of "method" was admitted to apply all round.

ORANGE TREES.—Members wished to know best time to plant orange trees, also cause for the tops dying back. [Probably about the end of August to end of September, but where water is available they may safely be moved until as late as November if care is taken to move them when there is little young sappy growth on the trees. Dying back from the top may be due to cold cutting winds or frosts, to collar-rot, to badly-drained soil, or insufficient moisture.—GEN. SEC.]

POULTRY.—A discussion took place on best all-round breed of poultry. Mr. Coote strongly advocated the White Leghorn, while Mr. Hargreaves was equally impressed with the merits of the White Minorca. No decision was arrived at.

Mount Compass, September 19.

Present—Messrs. M. Jacobs (Chairman), S. Arthur, R. Cameron, C. B. Hancock, A. J. Hancock, J. Jenkin, R. Peters, F. Slater, H. McKinlay (Hon. Sec.), and one visitor.

SEASONABLE HINTS.—Plant early potatoes on slopes of swamps, cabbages; sow peas, broad beans, mangolds, carrots, and parsnips.

POULTRY.—Mr. J. Jenkin read a paper on "Poultry," in which he repeated a deal of the advice which has been given by Mr. Laurie in the *Journal of Agriculture and Industry*. The following are some of the points discussed:—

Poultry-breeding may be regarded from three aspects, viz.:—1. High-class birds, for exhibition or sale; 2. Table fowls; 3. Egg production. Breeding of show birds, he thought, was out of the question here as people had too many others things to look after. The severity of the local climate would most probably interfere with the production of winter eggs, which bring the highest prices, say, during May, June, July, and August. Snug, dry, warm positions, and good feeding are essential for winter eggs. Clean wheat is preferable as food. With their abundance of summer green feed they might get enough of eggs in late summer and autumn to compensate for the lack in winter, and prices then are fairly good. He advised them to try this. He strongly advocated Minorcas as layers for the warmer weather period; but the Brown Leghorn is a great layer and a good forager. The White Leghorns and Andalusians are also good. Those who have a good-sized run should try the raising of table poultry. With their good supply of summer green feed they could have fowls ready for market at Easter at less cost than those who have to feed mostly on corn. The Indian Game-Dorking cross is the best in all ways, and is also a good egg-producing variety. The Minorca-Dorking cross gives a fine active fowl, combining a good combination of laying and table qualities. The best time for hatching is in September. Feed the chicks liberally three or four times a day to secure large birds and good results. Separate the cockerels from the pullets directly the former begin to crow. Feed fowls regularly and see that they are provided with grit or gravel, and give them bonedust also. Keep the fowlhouse scrupulously clean; limewash all parts frequently and dress the roosts with kerosene to destroy lice and ticks and prevent disease. Do not use condiments with the food, but a teaspoonful of sulphur with the food for each eight fowls occasionally in the morning will be beneficial. Keep the water always clean and in a shady place.

Amyton, September 21.

Present—Messrs. J. Gum (Chairman), J. Kelly, Wm. Mills, Wm. Gum, Wm. Hawke, H. Turner, H. Gray, James Gray, Thos. Gum, R. Brown, Wm. Hughes, and S. Thomas (Hon. Sec.).

FENCING.—Mr. W. Mills was of the opinion that it will pay to sheep-proof small holdings, as this enables the farmer to make the best possible use of the feed. Bad fences makes "rogues" of the cattle, and young cattle must be kept within good fences. Slack wires, broken posts, fences tumbling over so that stock can walk over them, or fences propped or held up with a barb wire high enough for stock to crawl under, are untidy and not creditable. If barb wire is properly used it is a boon to farmers, but it is dangerous when simply stretched from tree to tree through a mallee scrub, as he had seen sometimes. In this locality it is difficult to get posts, and they have to be carted a long distance. A good sheep-proof fence, 3ft. 4in. out of the ground can be made with strong gum posts 15yds. apart, with two iron posts between, a barb wire on top, and six No. 8 steel wires below; first at 12in. from the barb wire, and the next at distances of 7in., 6in., 5in., 5in., and 5in. beneath. Members agreed that 3ft. 4in. is high enough, but posts should not be wider apart than 12yds., with two iron droppers between. Red gum posts are to be preferred, if split from large trees, but box or sandalwood stand well if cut from old trees and charred. Steel wires do not last as long as iron wires.

MOST PROFITABLE ANIMALS.—Mr. W. Smith read a short paper on the question, "Which is the Most Profitable Animal on the Farm?" He thought fowls and cows pay as well as any animal, but no farm is complete without the horse, pig, and sheep. The fowls pay as well as cows when the question of labor and extent of country is taken into consideration. If the farmer relies chiefly upon his wheat fields the horse is undoubtedly in great request, and must be regarded as a most valuable and indispensable animal, and is essential when fodder has to be grown for the live stock. He did not agree with the suggestion that the cow might be used for the cultivation of the soil.

POULTRY DISEASE.—Mr. H. Gray said his fowls were affected with cramps and giddiness, and were unable to stand. The Hon. Secretary recommended a liberal supply of green bone meal and some meat. [Look on the bare places under wings and thighs for fowl ticks. If found, use a sponge or piece of flannel just damp with kerosene, remove the fowls to a fresh locality, and burn the fowlhouse. Build a fresh fowlhouse on plan illustrated in another part of this present *Journal*.—GEN. SEC.]

Strathalbyn, September 25.

Present—Messrs. M. Rankine (Chairman), — Butler, P. Cockburn, R. Watt, B. Smith, A. Rankine, and J. Cheriton (Hon. Sec.).

CONGRESS.—Different members reported on proceedings of the Congress of the Bureau. They considered that the discussions generally were very practical, and could not fail to do good. The question of breed of lambs for export was referred to, a good discussion followed, and it was the opinion of the members that the Down ram mated with first-cross Merino-Lincoln ewe was the most profitable cross, the lambs maturing sooner, are hardier, and fatten better than other lambs on similar pastures.

RYE.—Mr. Cockburn tabled a sheaf of rye of luxuriant growth, being over 5ft. 6in. high.

CHARLOCK.—Attention was called in local press to the spead of charlock. Members did not know the plant, and it was decided to obtain specimens.

Amyton, August 20.

Present.—Messrs. W. Mills (in chair), Jno. Kelly, Jas. Gray, Thos. Gum, H. Turner, R. Brown, A. Stone, and S. Thomas (Hon. Sec.).

IMPROVING BUREAU MEETINGS.—Mr. W. Hawke forwarded paper on "How to Make the Agricultural Bureau more Successful," being a *résumé* of paper read by Mr. Higgins, at Minlaton Branch, and published in July issue of *Journal of Agriculture*. Mr. Hawke pointed out that several of the Branches were practically dying concerns, and the only way to bring them to life was to work them on different lines to those in vogue. It was of vital importance to the members that the meetings should be made as instructive and attractive as possible. Every member should consider it his duty to take an active part in the meetings and be regular in attendance. Programme of subjects to be discussed should be arranged beforehand, and the members to whom the different subjects are allotted should look upon it as a matter of honor to carry out their undertaking. Set speeches and too strict ruling by the chairman will spoil the meeting. Members should not attempt to be sarcastic at each other's expense, nor insult the other members by going to sleep or appearing to do so at the meetings. Considerable discussion ensued. This Branch makes it a practice to draw up a programme for several months in advance, the members choosing, as far as practicable, their own subjects. Members were agreed as to the importance of each member of the Bureau realising his individual responsibility in order to make the Branch a success

EARLY PLOUGHING.—Mr. Turner read a clipping from the *Australasian* urging the importance of early ploughing, even if the land is hard and dry, as the land received more benefit from the rain after being ploughed.

Yorketown, September 9.

Present—Messrs. J. Koth (Chairman), C. Domaschenz, A. Jung, G. Bull, T. Corlett, J. H. Thomas, and J. Davey (Hon. Sec.).

ATTENDANCE.—The question of the poor attendance of members was discussed, and those present promised to be more regular in the future.

Riverton, September 23.

Present—Messrs. H. A. Davis (Chairman), T. Gravestock, J. Kelly, M. Badman, M. Nash, W. A. Lee (Gumeracha), and H. A. Hussey (Hon. Sec.).

"STANDARD BUSHEL" AND "BAGS IN."—Members discussed these subjects, but no new points were raised or fresh light thrown upon the questions. Mr. Davis suggested that the Branches should take the matter up with a view to united action. [When all the members of Branches have thoroughly studied the question as discussed and explained at the late Congress in Adelaide they may perhaps be in a position to suggest a practical settlement of the discontent which seems at present to be so very prevalent.—GEN. SEC.]

Brinkworth, September 21.

Present—Messrs. G. Freebairn (Chairman), J. Graham, C. Ottens, W. Wundke, A. W. Morrison, W. H. Pearce, S. Aunger, H. Shepherd, A. L. McEwin, J. Stott (Hon. Sec.), and two visitors.

CONGRESS.—Paper on "Standard Bushel" read at Congress was again read and discussed. Delegates to Congress reported on various subjects discussed at the meetings.

HOMESTEAD MEETING.—Members met at the residence of Mr. A. L. McEwin, and after the ordinary business was finished inspected the crops and outbuildings. Members were very favorably impressed with the condition of the manured crops, but those not manured were weak and spindly. Two acres of of Petatz Surprise wheat looked very healthy, and it promises to be a good wheat for this district. After inspection of various parts of the farm, Mr. and Mrs. McEwin entertained the visitors, and in the evening music and singing were indulged in. Members were well pleased with the practical value of the homestead meetings in connection with the work of the Branch.

RAINFALL.—At Condowie, for year, to date, 9·43in.; at Brinkworth, 7·73in.

Minlaton, September 23.

Present—Messrs. J. McKenzie (Chairman), J. Anderson, M. Twartz, J. D. Mayer, and J. Correll (Hon. Sec.).

CONGRESS.—The Chairman reported on proceedings of eleventh annual Congress, also on visit to Roseworthy College.

NITROGEN.—Some discussion took place on the value of peas and other leguminous crops. Several members considered the nitrogen collected by these plants more valuable for the promotion of healthy growth in wheat crops than nitrogen obtainable in commercial fertilisers.

Gawler River, September 8.

Present—Messrs. A. M. Dawkins (Chairman), J. Barritt, J. Hillier, Charles Leak, A. Bray, T. P. Parker, F. Roediger, J. S. McLean, H. Heaslip, J. Badman, J. Drinkwater, D. Humphreys, H. Roediger (Hon. Sec.), and fifteen visitors.

FARM IMPLEMENTS.—Professor W. Lowrie, M.A., B.Sc., Principal of Roseworthy Agricultural College, gave an address upon this subject, to the following effect:—

Whilst some implements were suitable on one farm they might be quite unsuitable on another, owing to differing soils and circumstances. Improvements in farm implements had, more than anything else during the past century, reduced the cost of production, although generally each improvement had at first been looked upon with suspicion. When winnowers were first introduced into Scotland those who used them were threatened with excommunication by the church for harnessing the wind. An instance of the great improvement in modern machinery was seen by contrasting the old method of cutting hay with the scythe and the present practice of using binders. Another was a comparison of the use of the flail for thrashing with that of the present day reapers and winnowers. It was about 150 years ago since the plough in something like its present shape was introduced. The old style of plough implement was a sharpened stick. Nineteen-twentieths of the wheat exported from India (more than that exported from all Australia) was grown upon soil cultivated by a wooden fork shod with iron. Thirty rupees, equal to 45s., covered the cost of the plough to the richest farmer in India. It was the custom to carry the plough home after a day's work, and one of the disadvantages of an iron plough was that it could not be carried home. When Ransome's plough was first introduced it could not compete with the native implement, because damp soil being turned up it was caked hard by the hot sun. The wooden plough or stick, on the other hand, only stirred the surface and left the soil underneath. Iron mould-boards were invented in Scotland about 100 years ago. Wilkie's mouldboard was still used. At first the iron plough was a single-furrow, and had no wheels. Improvements had been made until now 400 acres or 500 acres could be ploughed with more ease than our forefathers could plough a quarter of an acre. Perfection had not been reached, however, and improvements were constantly being introduced. He would like farmers to have more opportunity of seeing ploughs properly tested. Agricultural Bureaus would do more good by finding out how to grow more cheaply and more heavily the plants we now have than by introducing new seeds and plants. This could be done by improved implements. The Congress of Bureaus could with advantage engage competent engineers to test ploughs as to breaking, strength, average work, wear and tear, &c. Present trials were not always satisfactory. The glibness of tongue of the salesman was too prominent a feature. He preferred the short mould-board. It was not so handsome looking, but it did better work. American ploughs were lighter than English, and just as strong. Strength should not be sacrificed to lightness, but implements should not be too heavy. Land should be more cultivated than ploughed. The moist soil from the bottom should not be turned up, but the top soil cultivated. It did not matter how rough the ground was ploughed. The disc plough was being tried at the college this season, but there was not a fair chance of testing this implement on sticky soil, as the season was so dry. This, he thought, was the disc plough's weakness. It worked better than the ordinary plough, but the soil was left rough and ragged, and the draught was heavier than the ordinary four-furrow implement. It did not cover the weeds so well as ordinary implements, but it did not bring up raw soil. He had ploughed between 200 and 300 acres with it and broken one disc. Speaking of harrows, the professor said that the ordinary design of harrows was as awkward as could be. The tines broke at the neck, which was the weakest part. Then they had a square neck, and the knot was continually getting loose. Harrows should be made heavier than they were. There was two much copy of the English style. The conditions in England were different. There they sowed on ploughed land. The next implement referred to was the hay press recently purchased by the Government and in use at the college. If the farmers used this they would at present prices get from £1 to 25s. per ton more for their hay, and this, after taking into account the cost of working, would pay well. Combinations of farmers should buy a machine and press all the hay in the district, drawing lots as to the order in which it should be used.

Arthurton, September 21.

Present.—Messrs. W. Short (Chairman), W. H. Hawke, J. Koch, J. Pearson, M. Baldock, H. Baldock, C. L. Palm, J. W. Parker, J. B. Rowe (Hon. Sec.) and two visitors.

Mixed Hay Crops.—This meeting was held at the homestead of the Hon. Secretary, and before formal business was transacted members inspected various matters of interest, including a fairly good hay crop consisting of Cape Oats and White Tuscan wheat (one of oats and two of wheat). This was put in with 100lbs. of mixture of English super. and guano. Some members were of opinion that it would have been better to use Early Para wheat with the oats, as it ripened earlier than White Tuscan, but the Hon. Secretary considered that although late the White Tuscan was a better hay wheat.

Congress.—Delegates to Congress reported that one or other had attended every meeting as well as going to the Produce Depôt and the Agricultural College, and gave some very interesting particulars upon the various matters that came under their notice.

Rainfall.—Winulta, August, 0·94in., September, 1·46in.; Tiparra, August, 0·97in., September, 1·37in.

Elbow Hill, September 19.

Present—Messrs. H. T. Styles (Chairman), W. N. Beinke, H. Dunn, C. G. Ward, F. J. Brooks, W. Spence, J. Harvey, J. Elleway, J. Rehn, G. Dunn, C. L. DuBois, G. Wheeler (Hon. Sec.), and ten visitors.

Useful Animals.—Mr. C. L. DuBois read a paper on "The Most Useful Animal on the Farm," in which he gave the premier position to poultry. Taking a dozen Minorca hens and one rooster, costing £2, with interest at 10 per cent, and depreciation at 25 per cent., 14s., and food at £2 16s. 4d., the year's cost would be £3 10s. 4d. If properly cared for the hens should lay a minimum of 180 eggs each—they usually lay 200—mostly in winter, when they sell at 10d. per dozen. This would give 180 dozen at 10d.—£7 10s., less keep, &c., as above, £3 10s., giving a profit of £4, or 6s. 8d. on each hen. Compared with this the ewe sheep does not give nearly so much profit on capital and costs. There is still more profit if the eggs are turned into chickens. He then produced a lot of figures and statistics concerning the imports into Britain of eggs and poultry from foreign countries. Last year, from six countries alone, there were 1,680 millions of eggs and £640,000 worth of poultry imported there. Eggs are used by millions in the arts, sciences, and manufactures, winemakers, photographers, calico-printers, glove-makers, leather-dressers, and many others. Mr. F. J. Brooks read a paper on the same subject, giving pigs the first place for profit if well cared for; but if ill-bred, ill-fed, and badly housed they are anything but profitable. He preferred the Berkshire, or Berks crossed with Poland-China or White Essex. These grow very rapidly for the first six months, especially if they get plenty of milk. At six months the porkers should weigh not less than 100lbs. He calculated the cost of feed for six pigs for first six months after birth at £3 5s. 2d.—not allowing anything for milk, slops, &c. The value of the 600lbs. pork, at 4d. per pound, would be £10, giving a profit of £6 14s. 2d. In discussing these papers, most of the members were agreed that the fowl is the more profitable on the farm. They did not think the pig is profitable if it has to be shut up, and they are generally a nuisance if left to run about. The Chairman said the drawback was the absence of a market near at hand, but perhaps some of the minor products of the farm could be sent to Wallaroo. Some members hoped to see a small refrigerating plant established at Cowell, supplemented with a cool chamber on board the coasting steamer.

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INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. Cornish, Secretary).

Changes in Rates of Wages in Great Britain.

The following statistics relating to changes in rates of wages in Great Britain (based on information obtained from all available sources, verified and corrected by direct application to the employers, trades unions, and other parties concerned) are taken from the August issue of the *Labor Gazette :—*

The changes in rates of wages reported during July were all increases, and affected about 320,400 workpeople. The net effect of all the changes on the weekly wages of those affected was an increase of about 6¼d. per head. The principal increases were those granted to 260,380 miners and other colliery workpeople in South Wales, Durham, and Northumberland; to 29,500 iron and steel workers in the Midlands, North of England, and West of Scotland; to 2,500 bedstead workers in Birmingham district; to 2,295 engineers, &c., at Liverpool and Birkenhead; and to 8,000 cotton weavers, winders, and warpers at Ashton-under-Tyne. Changes affecting about 2,500 workpeople were preceded by disputes, causing stoppage of work; changes affecting about 159,200 workpeople took effect under sliding scales; and changes affecting 2,600 workpeople were brought about by arbitration or conciliation. The remaining changes, affecting about 156,100 workpeople, were arranged by direct negotiation between employers and workpeople, or were conceded voluntarily by the employers.

For the seven months, January to July, the number of workpeople (separate individuals) reported as having received advances or sustained decreases was about 955,300. Of these 953,000 obtained a net average increase of 1s. 3d. per head, and 2,300 sustained a net average decrease of 1s. 4½d. per head. The general effect of all the changes was a rise of 1s. 2¾d. per week in the wages of the 955,300 affected.

Old-Age Pensions in Europe.

A report on "Provision for Old Age by Government Action in Certain European Countries" has been issued by the Labor Department of the Board of Trade, England. It describes the nature and gives, so far as possible, the results of the working in each country of the laws under which provision for old age is either encouraged or declared obligatory. The countries dealt with are Russia, Norway, Sweden, Denmark, Holland, Germany, Belgium, France, Italy, Austria, and Roumania. Of these eleven countries, Germany and Denmark alone can be said to have adopted a general system of pensions or relief in old age.

The German law of 1889 (in operation since January 1st, 1891) embraces practically all wage-workers—other than those entitled to pensions in their capacity of public servants—above the age of 16 and earning not more than £100 per annum. It fixes the scale of contributions to be paid by them and by their employers, and places the responsibility for the payment of those contributions on the latter, whom, however, it allows to deduct half the amount from wages. It provides for the addition of a sum of £2 10s. per annum, at the cost of the State, to each pension acquired under the law. The old-age pension becomes payable after the completion of the 70th year, and is given simply for old age, irrespective of physical fitness; while the invalidity pension becomes payable, after the completion of 235 weeks of contribution, to any person who, irrespective of age, is permanently unable to earn one-third of his or her previous wages. In the year 1897 (the most recent for which statistics have been published) over 400,000 persons drew pensions amounting to no less than £2,750,531, of which £1,079,823 was provided by the State. Of these amounts about one-half was expended on invalidity and one-half on old-age pensions. It has been officially estimated that 12,144,530 persons out of 52,279,901, representing the total population of the German Empire (census of December 2nd, 1895), are liable to insurance under the law.

In Denmark the system adopted is very different, the law of 1891—in operation since July 1st, 1892—providing for a special form of old-age relief to any necessitous person of good character who is over 60 years of age. There are no direct contributions by the recipient, and the amount of the pension is not fixed by the law, though it must be sufficient for the needs of the applicant and his family. Receipt of this relief does not impose electoral disabilities. In 1896, 36,246 persons, with 14,223 dependants, were receiving pensions in Denmark under this law to the amount of £216,317, of which, roughly, half was paid by the State and half by the communes.

In France provision for old age is obligatory for seamen and miners, and the Government grants £440,000 per annum in support of the seamen's fund, which dates from the year 1681. It also makes annual grants to encourage persons to purchase old-age annuities from the *Caisse Nationale des Retraites pour la Vieillesse*, either directly or through the medium of friendly societies. It also makes grants in aid of pensions established for necessitous persons by departments and communes. The total expenditure of the State on behalf of old-age pensions in France is probably not less than £600,000 per annum.

In Belgium the Government and certain provincial authorities make grants to encourage friendly societies to induce their members to subscribe to the *Caisse Générale d'Epargne el de Retraite* through their medium. In some districts of Belgium old-age pensions are granted to persons formerly engaged in mines out of the funds to which mine owners are compelled to subscribe.

In Austria there is a system of compulsory contributions by mine-owners and miners to funds from which pensions are granted to aged workmen.

In Russia old-age insurance only extends to Government mining establishments.

In Roumania, where compulsory insurance in mines and quarries was enacted by a law of 1895, the law is not yet operative, owing to the fact that no enterprises to which it applies have been started.

In Italy the law of 1898, to establish a National Pension Fund, will not come into force until a month after the publication of a royal decree approving the rules by which the fund is to be governed.

In Sweden, Norway, and Holland the question of old-age pensions has not gone beyond the stage of projects.—*Labor Gazette* (England) for August.

Woman's Work and Wages.

By Inspector Agnes A. Milne.

Recognising that man's salvation to a very great extent is in his own hands, and feeling that the times demand a strong, united, and persistent effort to stem the tide of misery and poverty that is assuredly gaining upon our industrial system, and which threatens to submerge many of our workers in its baneful grasp, I maintain the remedy lies in a quickening of the industrial evolution. But how can such an evolution be brought about? It cannot be done with one blow, nor is it wished to prohibit home work, for under the present system that would be most disastrous to many a poor woman with perhaps a sickly husband, or a widow with several young children, who could not possibly go into a factory to work. But let such work (home work) be permissible and regulated by the Factory Acts, thus shifting the responsibility for the conditions of all industries on to the shoulders of those who profit by disorganisation; thus soon would the "sweated" trades be revolutionised.

It is simply impossible for the factory inspectors, under existing circumstances, to know or find out all the places where "sweated" goods are made up; but make the virtual employer—that is, the trader who gives work out to be done at home or in a "sweater's" den—be responsible for the conditions under which the work is done, and for the observance of the law in regard to hours of labor, just as if the work was being done on his own premises or in his own workroom, thus shifting the responsibility of the conditions of industry on to the shoulders of those who profit by this system of business. I might go even a step further and make the landlord who lets the premises for manufacturing purposes or permits dwellings to be so used responsible for the conditions and proper use of those premises, and also make him responsible for the due registration of the same. In collecting his weekly rents he has abundant opportunities of obtaining the necessary information. So thus, between the employer's register of out-workers, the landlord's register of his own premises, and the occupier's notice of opening a workshop the factory inspectors would be able to obtain a more complete record of places where work is done otherwise than in a factory.

The definition of "factory" given in our own Act of 1894 means any manufactory, workshop, or workroom in which six or more persons are employed, and also states every person occupying a factory at the coming into operation of the Act shall give within three calendar months notice of such commencement, and any person neglecting to comply with the Act shall be deemed to have committed a breach of the Act. The Women's Industrial Council of London gives quite a distinct definition between "factory" and "workshop." A factory is a workplace in which machinery is moved by steam or mechanical power; a workshop is, generally speaking, a place in which no mechanical power is used. Workshops are again defined from domestic workshops, that is, places in which the only persons employed are members of the same family dwelling there. By this definition a place or room in which one person—it may be an apprentice—is employed by the occupier comes under the provision of the Workshops Act; and until these places are regulated here by the Factory Act or wage boards the sweating will continue and increase.

Mr. Hobson, M.A., in his writings on the problems of poverty, says—"Wherever union exists, or even a general knowledge of the ruling prices inside a factory is possible, sweating decreases; but combination is quite impossible where the workers never meet, or where the out-workers can be carefully and systematically set off against the in-workers and against one another for the purpose of lowering wages."

If all employers of women were compelled to provide factories, and employ them there doing the work at present done at home or in small and unapproachable workshops, several wholesome results would follow—the condition of effective combination would be secured, public opinion would assist in securing decent wages, factory inspection would provide shorter hours and fair sanitary conditions, and last, but not least, women whose home duties preclude them from full factory work would be taken out of the field of competition. And this can only be done by wise and judicious legislation; and as history repeats itself, so may we as a nation when federated become the emancipators of the toiling masses, both male and female.

The Onkaparinga Cheese and Butter Factory.

Mr. Cuthbertson, the manager of the above factory, last month furnished the following particulars of the above factory:—About 7,000galls. of milk are at this time of the year received per week, but during the busy season 15,000galls. of milk are treated. About 1 ton of butter per week is now made, and 4 tons of cheese per month; but when the factory is in full swing 2 tons of butter and 16 tons of cheese per month are turned out. The plant consists of two Cornish steamboilers, 28-horsepower; one Tangye engine, 10-horsepower; one Hall's refrigerator, No. 4; two separators, and the usual churns and butter workers; also, six cheese vats, 2,000galls. capacity, with equivalent pressing accommodation. In the storage-room there is room for 50 tons of cheese. All skim milk and whey is returned to the dairy farmers who supply the milk, and by them it is utilised for feeding pigs. Sixty-five persons supply the factory with milk. Twenty-five cows are the average number kept by each farmer, and the work of supplying the milk and managing the dairies gives employment to 150 persons. There are six hands employed in the factory. The produce of the factory is sent to the Adelaide market by vans, and the whole output is sold in Adelaide.

Schenectady Locomotives for England.

The first of the ten freight locomotives which the Schenectady Locomotive Works are building for the Midland Railway, England, has a decidedly handsome appearance, and impresses us more favorably in this respect than the engine built for same company by the Baldwin Company, the first of which was illustrated in the *Scientific American* of May 20th. The locomotives are of the Mogue type, with a single pair of leading wheels and six wheels connected. The tender is of the standard six-wheeled English type.—*Scientific American*, July, 1899.—[What are our British manufacturers about?—Editor.]

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NOTES AND COMMENTS.

The weather during October has been very disappointing from the point of view of the cultivator of the soil. With a good rain following the favorable weather during September even the late crops would have yielded well, and on the whole a good harvest would have been gathered this season Unfortunately, however, generally speaking nothing but light showers have fallen, and to make matters worse drying winds have been frequent. Several very severe frosts have also been recorded, and although these have not—except in a few cases—done much damage to the wheat, the orchards and vineyards have suffered severely. In many localities the apricot crop has been almost destroyed, and the vines have been injured to such an extent as to make it pretty certain that the grape crop on the whole will be small. Reports concerning pip fruits are more favorable, and at least a fair crop is expected.

The showery weather during the early part of the month with frequent intervals of warm sunshine has been very favorable to the development of various fungoid diseases of fruit trees. In some cases peach curl-leaf has spread very rapidly, giving the impression that the trouble is climatic, whereas we know that it is simply that the climatic conditions have been just what were required to cause the spores of the disease to germinate. Those orchardists who have neglected to spray their apple, pear, apricot, and peach trees because of the comparative freedom from disease during the past few years, run very great risks of losing heavily through their false economy in this matter.

During the past month a Select Committee of the House of Assembly has been taking evidence concerning the question of amending the present regulations dealing with the codlin moth. The Committee was appointed as the result of a petition from a number of growers in the hills, and packers and hawkers from Adelaide. The regulation to which most objection is taken is that preventing the sale of fruit infested by the codlin moth caterpillar. The officers of the Department of Agriculture have always opposed the sale of infested fruit, as they consider it unfair to purchasers of fruit, as well as to the many owners of clean gardens, to allow the distribution of such fruit. The Committee is expected to report early in November.

Advices from America report unfavorable prospects for the apple crop, which, though good in some districts, is on the whole considerably below the average. "It's an ill wind that blows nobody any good," and this news, though unfortunate for the American growers, gives fair grounds for expecting remûnerative price for our apples in London next season.

The *American Cider and Vinegar Maker* says:—"Wherever the experiment of putting apples in pits has been tried, it is found that they keep better than in ordinary house cellars. There is less change in temperature and less rotting. Unlike potatoes in pits, apples should not be allowed to come in contact with the soil. It injures their flavor, making them, as it is said, 'taste of the soil.'"

Anything that will avert danger to vines and fruit trees from late ground frosts is of interest. It has been confidently asserted and reasserted, after trials made in California, that spraying the stems and branches of vines and fruit trees with any kind of whitewash will delay growth from a fortnight to four weeks. It is maintained that early growth is controlled not so much by soil temperature as by the action of the warm air on the stem and branches of the plants, and that by the application of air-slacked lime or whitening to those parts the heat is radiated, so that the awakening from the winter sleep is retarded for the period above mentioned.

Considerable attention has been paid of late years in California to the improvement of the loquat. Probably none of our commercial fruits have been propagated in such a haphazard way as the loquat, the result from continued growth of seedlings being that the fruit is nearly all skin and stone, and very often devoid of flavor. Mr. C. P. Taft, an orchardist of Orange, Cal., speaks enthusiastically of some comparatively new varieties of loquat grown and fruited by him for several years. The best of these is stated to be the Advance, which bears fruits 2in. to 3in. in length, and from 1in. to 1¼in. in diameter. The fruit is nearly pear-shaped, and is borne in large clusters. The Premier is a salmon-colored fruit, large, juicy, sweet, but of peculiar flavor. The Victor is the largest of all and very suitable for canning.

In California an orangery of seventeen acres has had a complete cover of laths erected over it to protect the trees from the effects of frosts. Three inch by 4in. redwood posts are erected 21ft. 3in. apart each way, connected by pine rafters and braced securely to carry Arizona laths 1in. apart, woven with three double strands of wire into sections 21ft. 3in. by 5ft. Fifty thousand laths per acre are required, and the cost of covering the orangery amounted to between £90 and £100 per acre. It is found that the trees require only about half as much water and make better growth than those not covered, besides which they are not affected by the frost. It will, however, require very good returns to pay interest on purchase-money and expense of bring the trees into bearing, interest on cost of covering, together with expenses of cultivation, irrigation, harvesting, &c.

At the Ohio Agricultural Experiment Station, U.S.A., Prof. F. M. Webster has been trying to find a remedy for the San José scale, which he says "the orchardists have more reason to fear than any other pest." The conclusions he has arrived at are that for nursery stock, fumigation with hydrocyanic acid gas is the best. For trees growing in the orchard the cheapest and most efficacious treatment is whale oil soap, from ¾lb. to 1lb. per gallon of water, applied just when the buds are swelling; if applied earlier to peach trees the buds drop off, and the trees are killed. The treatment would have to be continued for three or four seasons. This treatment has proved surprisingly efficacious also for curl-leaf on peach trees, saving 75 to 100 per cent. more fruit than is obtained from untreated trees. The fruit is also larger and the trees far more healthy and luxuriant.

No man in Australasia was better known, or more liked by those who knew him intimately, than the late J. Ednie Brown, F.L.S., Conservator of Forests in Western Australia, who filled a similar office in New South Wales, and before that in South Australia. Mr. Brown died suddenly at Perth from heart failure after influenza. He was a most generous man, kindly, good-natured, good-tempered, and a faithful friend. In his capacity of forester he was eminently successful, and trees seemed to spring up in his footsteps wherever he went. South Australia suffered a great loss when he was tempted to leave her service.

The wheatgrowers on the Darling Downs, Queensland, have suffered severely from frost during the past month. Most of the crops have been so badly injured that they will have to be cut for hay. This will prove a great disappointment to the growers who had the promise of a good yield, but a local paper extracts cold comfort from the experiences of the season, stating that rust had made its appearance, and with warm seasonable weather would spread so rapidly as to render it necessary to cut the crops for hay; and naively adds that frost-bitten hay is of more value than badly rusted hay.

The six bulls purchased by Mr. Alick Murray for the Department of Agriculture have been loaned to the following Branches of the Agricultural Bureau:—Jerseys to Port Elliot, Clarendon, Gumeracha, and Dawson; Ayrshires to Caltowie, Mount Gambier, and Port Pirie. One of these latter belongs to the Clarendon Branch, which has placed it at the disposal of the department in return for the services of a Jersey bull. There are twenty-three bulls belonging to the department now loaned to the Branches. Of these fifteen are Jerseys, seven are Ayrshires, and one is a Holstein. Next March seventeen of the bulls will be available for transfer to new localities.

The Department of Agriculture has ordered a Ganz flour-testing mill from Buda-Pesth, which will be erected at the School of Mines. At present a great deal too many varieties of wheat are being cultivated, with the result that the average sample is uncertain and of inferior milling quality. Naturally, some varieties of wheat are of much greater milling value than others, and the admixture of inferior qualities must depreciate the value of the flour. Even supposing the different qualities are kept separate, and are ground separately, the miller cannot afford to ruin his reputation by turning out ever-varying qualities of flour. Half a dozen varieties of wheat of first-class milling quality, heavy bearing, hardy, and rust-resistant, ought to be sufficient for the requirements of South Australian farmers; instead of this there are about 1,600 named varieties of wheat being tried in the colonies.

"Line upon line, precept upon precept," is the only way to force the majority of people to understand the truth. Farmers and others should begin at once to order supplies of commercial fertilisers for next season's work, else they may find it to be impossible to get what they want, and be compelled to put up with inferior qualities or do without. The law says that every person selling fertilisers must (not "may") give to the purchaser a statement in writing or print showing the percentage of phosphoric acid soluble in water, soluble in citric acid, and insoluble, also of potash and nitrogen. The purchaser should remember that in superphosphate only the water-soluble phosphate is at once available to the plants; the citrate-soluble and insoluble phosphate may take a very long time to become available to plants. Bi-calcic and tri-calcic phosphates are *not* to be placed on a level with mono-calcic or water-soluble phosphates where immediate results are wanted.

Maize, dhurra, sorghum, holcus, and millets will often yield heavily when cultivated several times during growth. Left uncultivated, under very favorable conditions of soil and weather, a moderate crop is sometimes produced, but there is no doubt that the yield would have been very much greater had the field been hoed three or four times to a depth of 2in. to 3in. A century of practical experience in America has proved this to be the case, and wherever it has been tried in Australia the same beneficial results have followed the practice

"Tympanitis," "bloat," "blast," "hoven," "blown," all have the same meaning when applied to cattle or horses which have eaten too much dry grain or succulent fodder, in consequence of which gas is generated rapidly in the stomach, which becomes so distended that the action of the lungs and heart is often stopped, and the animal dies. Hitherto the best remedy for this trouble has been the administration of a tablespoonful of carbonate of soda in a pint and a half of water, but a Canadian cattle breeder states that for fifteen years he has never failed to cure a bloated animal by simply pouring a couple of bucketfuls of cold water along its back. This is worth a trial, and those who do try it are requested to communicate results to the editor of this *Journal.*

The vicious bull is a constant menace to the life and limbs of all who approach him, and he is certain to transmit his vices to his progeny. There is only one remedy—a bullet in the centre of the forehead from a good rifle at short range. It is a safe practice to distrust every bull and every horse, even though each may be reputed to possess a most quiet disposition. It is nearly always the quiet animal that does the damage, but still, when any animal is known to be vicious, get rid of it at once.

At the annual meeting of the committee of the Distressed Farmers' Relief Fund, held on October 24, a special committee was appointed to draw up a scheme for utilising the funds on hand with a view to the establishment of a permanent fund, to which farmers may subscribe, and from which subscribers may obtain relief in times of necessity. There is no doubt that a fund which is available only to subscribers—in other words, a co-operative fund—will meet with far more support than the scheme submitted to the joint committee of the Agricultural Bureau and the Relief Fund Committee by Mr. F. Krichauff about twelve months ago, which was objected to in many quarters on the grounds that it was making it a charitable institution, and pauperising the farmers. In connection with this matter the various Branches of the Bureau are requested to consider the scheme outlined at the Annual Congress by Mr. F. A. Thomas, of Johnsburg, but it will probably be better to await the publication of the report of the Distressed Farmers' Fund Committee, and consider the two together.

From time to time paragraphs have been printed stating that lemons and oranges can be kept good for long periods by being packed in damp sand. A citizen of Adelaide, since deceased, packed several hogsheads with lemons, headed them in, and filled up with rainwater. These lemons were carried to London in a sailing ship as ordinary cargo, and arrived as fresh and full as the day they were picked. Mr. J. W. Cardon, of Mildura, has for two years past packed oranges in damp sand for some time, and out of seventy cases this season hardly 1 per cent. was spoiled. All the rest were perfectly sound.

QUARANTINE AND PROHIBITION IN NEW ZEALAND.

An Order in Council was issued by the Governor of New Zealand on September 18th, 1899, prohibiting the introduction into New Zealand from the Australasian colonies of all horses, cattle, sheep, swine, goats, deer, &c., and dogs; also fresh meat (except frozen), bones, horns, hoofs, hair, hides, skins, offal, or other part of any such animals, and all fittings which may have been used in the transport of such animals, except under conditions set forth. Horses and dogs from Queensland and Western Australia are prohibited; from other colonies they must be accompanied with a certificate that they are free from infectious and contagious diseases, have not been in contact with any diseased animals, that the colony from which they came is clean, and that the vessel is a clean Australian vessel. Cattle and sheep from Queensland and Western Australia are prohibited, and from the other colonies must be accompanied by a declaration by owner and a certificate by a veterinary surgeon for cattle and inspector of stock for sheep that they are free from disease, and are then subject to quarantine for ninety days for cattle and thirty days for sheep. Swine are prohibited from Queensland and Western Australia, but from the other colonies may be landed on production of declaration by owner and certificate by veterinary surgeon that they are free from disease. Goats, deer, and other ruminants must have similar declarations and certificates. Animal manures are prohibited from Queensland and Western Australia, but admitted from other colonies after having been subjected to a moist heat of 250° Fahr. for at least two hours, equal to an indicated steam pressure of 30lbs. per square inch. All animal manures to be put up in new bags. Bones in a raw state, crushed or uncrushed (except from Queensland and Western Australia), may be landed and taken direct from a ship to manure works approved by the inspector, and there submitted to a moist heat of not less than

250° Fahr., as aforesaid. All bags to be new, and to be at once burned, or steamed, or boiled, before being again used. Hides (with exception of Queensland and Western Australia) may be imported from any clean colony, taken direct from ship to approved tannery, and manufactured into leather if from cattle that have been killed for human consumption and not from animals that have died from disease, such hides to be thoroughly salted.

No stock, animal manures, bones, or hides shall be landed in New Zealand unless the same are the produce of a "clean" colony.

FOR BEEKEEPERS.

Swarming.

Swarming has practically ceased on the plains, and beekeepers have been freed from an anxious time, especially those who have suffered from the prevailing influenza. In the hilly districts and South-East vigilance will still be necessary in order to secure the late swarms.

Supply of Queens.

The old queen always leaves with the first swarm, and if that has been securely hived there will be no need for further anxiety; but second and third swarms may have unfertile queens, so that the combs must be carefully examined to see if the queens are laying. Ten days after the swarm has been hived there ought to be eggs in the cells; if there are no eggs, then a comb from another hive containing brood and eggs must be put in; and if, three days after, queen cells have been started a laying queen should be given to the bees, or else, if the colony is weak, join it to another that has a fertile queen.

Stored Food for Bees.

At present the gardens are filled with flowers and there is no dearth of food for the bees, but it is always necessary to maintain a watch over the stores. There is generally a bad time before the end of the season, when it will be necessary to supply food to keep up the strength of the weaker colonies. Do not leave the bees with too large a supply at the present time; rather take away some full frames and substitute empty comb. This will make the bees work to fill up whilst there is an opportunity. Later on, when flowers are scarce and stores in the hives are failing, one full comb may be returned to each hive, and followed by others if required.

Combs and Wax Moths.

Be very careful to store combs and comb honey in a place with plenty of light and air between them, else the wax moths will get at them. The wax moth does not like the light, but will play great havoc with combs packed closely in a dark place.

Late Swarms in the Hills.

Three or four empty clean hives should always be kept ready for swarms, which may shed off at any time when the weather is fine and calm. It is always desirable to place a shade over the newly-hived swarm, and stands or places should be ready to receive the new hives at night, when the bees have settled in their new home. It is usual to place a shingle or some other obstruction in front of the entrance, so that the bees on leaving the hive in the morning shall take note of its location. If the swarm is weak, as late swarms are apt to be, it may be desirable to unite it with another weak swarm, removing the weakest queen and smoking and spraying the bees with weak peppermint water.

FOWL TICKS.

The fowl tick (Argas reflexus) is very prevalent in some places, and special measures must be taken to prevent their attacks on fowls; else the poultry will soon cease to exist. The ticks are dark-brown in color when full grown, and most of them hide during daylight in crevices or other places about the houses. or under the bark of trees where the fowls roost at night. A few of the ticks remain attached to the bodies of the fowls on the naked parts beneath the wings and between the thighs and body. The head and shoulders of the ticks will be buried in the flesh, and the bodies, which are almost blue, are usually very small. If forcibly pulled away, the head, legs, and shoulders will remain in the flesh, causing sores and irritation. The best way to remove the ticks is to dip a piece of flannel or sponge into kerosene and olive oil mixed in equal proportions, squeeze out excess, and swab the ticks with the squeezed cloth or sponge, and leave them to drop out. But there are still hundreds of thousands of the ticks existing about the places where the fowls roost at night, and it will be necessary to remove the birds to clean quarters. The best fowlhouse, under such circumstances, would be one of stone, smoothly plastered inside and outside, because the ticks will hide in the smallest cranny and will enlarge their quarters by burrowing. The roosts should be slung by wires from rafters or beams, and to prevent the ticks crawling down the wires the wires and stays should have some kerosene-saturated wool wrapped around them. Another good fowlhouse can be constructed of galvanized iron, with the whole of the framing outside (as illustrated in our October, 1899, issue). In all cases it would be well to arrange for good ventilation of the house by means of sliding sashes. The advantage of iron houses is that if they are infected with fowl ticks the perches can be removed, a good lot of old straw or grass placed inside and set on fire. The heat generated will roast the ticks to death, but the outside woodwork is not very likely to catch fire, and if it does can be easily extinguished with a little water. Fowl ticks and lice seem to be able to live, increase, and multiply exceedingly without the presence of the birds; therefore it is necessary to burn all woodwork that will not pay for the trouble of saturating with crude petroleum or rough kerosene. This is pretty well the only thing that will kill ticks and lice if we cannot adopt the fire test.

THE CARE AND PRESERVATION OF FARMYARD MANURE.

Although it is scarcely likely that farmers in South Australia will ever produce sufficient manure on the farm for anything but a very small proportion of the areas they cultivate, still the care and preservation of the manure is a matter of very considerable importance. Generally speaking, very little attention is paid to this matter, the manure, except where carted and spread fresh, being heaped up in any convenient place, exposed to all weathers, no care being taken to save the liquid excrements or to prevent the soluble constituents being washed away.

During the past few years some very valuable experiments have been conducted at the Ottawa Agricultural Experiment Farm in the various methods of treatment of manure, equal parts of horse and cow manure being used in each case. The manure in fresh condition, *i.e.*, the accumulations of about ten days, showed on analysis to contain 12lbs. of nitrogen, 6·2lbs. phosphoric acid, and 15·2lbs. of potash per ton. This is much above the average quality, doubtless due to liberal diet of the animals and the care exercised to retain and preserve the liquid portions. In these experiments it was found that 8,000lbs. of fresh manure was reduced in weight by rotting to 2,980lbs. at the expiration of three months, to 2,308lbs. at expiration of six months, to 2,224lbs. in nine months, and to 2,185lbs in twelve months when under cover. Exposed, the weights during the same periods were 3,903lbs., 4,124lbs., 4,189lbs., and 3,838lbs. respectively, varying according to the state of the weather at the time it was weighed. It appears from the various experiments carried out that the solubility of the fertilising constituents does not increase, and the manure receives no apparent benefit from rotting for a longer period than three months. The following figures show the loss resulting from rotting of manure exposed to the weather as compared with manure rotted under cover. It must, too, be borne in mind that even with the exposed manure care was taken to prevent loss of the fertilising constituents, and it was consequently of very much higher value than the manure stacked under ordinary conditions :—

	Organic Matter. Lbs.	Nitrogen. Lbs.	Phosphoric Acid. Lbs.	Potash. Lbs.
Fresh manure	1,938	48·1	24·8	61·2
Protected manure, three months rotting ..	879·4	39·6	24·7	65·2
Exposed manure at three months	791·1	33·9	22·4	47·6
Protected manure at six months	802·9	39·6	26·1	59
Exposed manure at six months	651·9	33·1	22·2	44·1

The constituents in the fresh manure were worth, approximately, £2 3s. 6d.; in protected manure at three months, £2 0s. 2d.; in exposed manure at three months, £1 12s. 10d.; in protected manure at six months, £1 19s.; in exposed manure at six months, £1 11s. 6d. No allowance is made for the organic matter, which, however, is a most valuable and important constituent of farmyard manure, and this would add still more to the loss through rotting out of doors. The values, of course, are those of the ingredients at market rates in Canada, and would not be the same in South Australia, but the result would work out proportionately the same. Shortly, it may be stated that at the end of twelve months there was a loss in nitrogen of one-fifth in the protected and one-third in the exposed manure. The latter also lost 10 per cent. more organic matter, while one-sixth of the phosphoric acid and one-third of the potash was lost in the exposed and practically none in the protected.

In experiments carried out at the station better results have been obtained from manure carted fresh and spread, but the benefits of rotting the manure, where care is taken to prevent loss of the fertilising constituents, is summed up as follows :—The manure becomes disintegrated and of uniform character throughout, resulting in easier and more uniform distribution in the field, and allowing a more intimate mixing with the soil; the coarse litter is decomposed, and its plant food thus made more available; compounds are formed from the organic matter that more readily produces humus in the soil; the availability of the nitrogen of the solid portion of the manure is increased; the phosphates are made more assimilable; there is less weight of manure to haul to the fields; the larger number of weeds seeds that may be present are destroyed.

Experiments were also conducted to test the effect of gypsum in preventing loss of fertilising constituents, 50lbs. being applied to 1 ton of fresh manure. The result showed that gypsum retards to a certain extent the destruction of organic matter, but no useful effect is shown on the percentage of nitrogen. The proper place to use the gypsum would appear to be in the stable, as the nitrogenous compound in the urine is very quickly converted into carbonate of ammonia, which volatilises and escapes unless some suitable absorbent or fixer is present. Gypsum is such a fixer, converting the carbonate into sulphate of ammonia, which is not volatile. When the manure heap is kept compact and moist there is not any considerable escape of ammonia, but unless the floor is watertight there must be a loss of potash where the heap is kept moist by rain or artificial means.

In the experiments carried on at the Experimental Farm, over periods varying from five to eleven years, with different fertilisers, farmyard manure has in every case given the best results, 12 to 15 tons per acre being used. With wheat and barley the difference in yield of grain between fresh and rotted manure is very slight; with oats the fresh manure gave considerably better returns. In the two farms the third best returns were obtained from 500lbs. of Thomas phosphate mixed with 6 tons of actively fermenting manure, and allowed to heat for several days before being used. With root crops the respective returns vary, but in each case the barnyard manure, either rotted or fresh, heads the returns. It will therefore be seen that as the fresh manure gives ton for ton equally good results as rotted, it is decidedly more economical, as 1 ton of well-rotted manure represents from 2 tons to 2½ tons of fresh manure.

Under South Australian conditions direct manuring of crops for grain with farmyard manure is not, on the whole, advisable. Probably the best use to which it can be put is to apply it to the land intended for fallow, to encourage the growth of herbage, or to crops for green feed and ensilage. The results of the experiments quoted show that the best plan is to cart and spread it fresh, working it into the soil as soon as possible; but it is not always possible to do this, weather and labor conditions having to be considered. Where the manure is rotted a shallow pit at a lower level than the stables and yard should be constructed, with drains leading from the stables to it. The bottom should be made as near watertight as possible, and a roof of thatch or other material erected over the pit, to protect the heap from the weather. The stables should be well paved, with drains in which the liquids will collect, and plenty litter or gypsum should be used to prevent loss of ammonia. The manure from the pigstyes and fowlhouses, all wood ashes from the house, and any refuse that will decay should be added to the heap. Old bones should be broken up as small as possible and mixed with the fresh manure. The heap should be well mixed to secure evenness, but kept compact and moist, but not wet. It should be remembered that while we must depend upon commercial fertilisers for our grain crops that farmyard manure adds to the soil humus, and that the more humus in the soil the better will it retain moisture.

JOHNSON GRASS.

By M. Badman, Tarlee.

It is generally considered that land cropped with this valuable summer fodder is useless for any other purpose, owing to the impossibility of destroying the plant. This, however, I have proved to be incorrect, and the Editor has asked me to give some particulars concerning my experience for the benefit of those who have been afraid to make use of, probably, the hardiest of all our summer fodders.

About six years ago I ploughed up a paddock of two acres early in winter, and worked it down to a fine tilth, sowing 3lbs. to 4lbs. Johnson grass seed in the spring (middle of September to end of October). This gave me a splendid plant; and to allow it to obtain a good hold no other crop was sown on the land for two winters. The second year I gathered £20 worth of seed, besides the feed it produced. The paddock was then fallowed and sown to maize, which was cut for the cows. Owing to the hot winds having affected the crop, there was not a heavy yield of seed from the Johnson grass. Following the maize I put in wheat, and reaped an excellent crop. At harvest time the Johnson grass was just up to the comb of the stripper, and two weeks later it was higher than the stubble, and provided a considerable quantity of good food during the summer. The following winter no crop was put in, but in 1897 it was fallowed early and sown with maize, which was cut for the cows. The seed of the grass was gathered, and the cattle turned in to the paddock about the middle of February. The land was then worked well with the scarifier, and a crop of Early Para wheat, with a little Thomas phosphate, sown about the second week in April. At the end of October the crop was cut for hay, being quite 5ft. higher, and giving over 2 tons per acre; in fact, it was the best crop I ever took off this paddock. In some of the sheaves there were a few stems of Johnson grass, but not much; but as the weather got warm the grass grew quickly to a height of 3ft. to 4ft., and in some of the bunches there were several hundred stems. The paddock in question consists of dark and light loam, and some heavy flat-lying soil, and has never had any water other than the natural rainfall.

SOME PRACTICAL HINTS ON DAIRYING.

By G. S. Thomson, N.D.D., Dairy Instructor.

Selection of Herd.

Whilst addressing meetings in various parts of the colony, many questions have been submitted and have been carefully noted by myself. As the answers to most of them apply generally, I consider it desirable to place them in print.

Wherein lieth the foundation of success in dairying? First, the dairyman must consider the capabilities of his land and its suitability for the various milking breeds of cattle, and the most profitable products to sell. With heavy productive land, he should select as the foundation of his herd a good bull of one of the heavy milking breeds. Does the Jersey, Guernsey, Ayrshire, or Black Poll meet the requirements of the farmer? When it is remembered that the bull is half the herd, and a fatal blunder will be made if an unsuitable animal is selected, the importance of careful decision is manifest. Looking at the matter from all points of view, it will generally be admitted that the milking strains of Shorthorn will be more suitable than any of the breeds mentioned before. They are docile and good tempered, good heavy milkers—many giving up to 700galls. annually of rich milk—they respond readily to liberal feeding, and are valuable for the butcher when not required or unfit for the dairy herd. Fine specimens of cross-bred Shorthorns are to be found in various parts of the colony, and recently one specimen, which is proving a little gold mine to her owner, came under my notice. This animal, at the time of my visit, was giving 5galls. daily, and on testing the milk I found it gave the remarkable return of 8 per cent. of butter fat. From two days' milk 7lbs. of butter were made—equal to over 24lbs. per week. This case is exceptional, but many of our Shorthorn crosses give 35galls. of milk of normal richness weekly during full milking. Another noted feature of the milking Shorthorn strains is the prepotency of both sire and dam, their distinctive qualities being imparted to their progeny. The bulls are more likely to improve the milking standard of the herd than are the bulls of any other breed.

But is there any danger of purchasing the wrong strain? This important question is usually overlooked. There is great danger that many of the so-called dairy Shorthorns belong to the Booth, or fattening class, and not to the Bates, or milking strain. The natural result, if this is the case, will be that the progeny will turn out to be poor milkers, although in many cases their udders promise an abundant supply. It is within the power of skilful breeders to gradually change the milking capability into that of putting on fat. This is likely to occur when breeding for the show yard, where weight is particularly in favor.

I have been asked several times whether the Black Polled bulls are profitable in a milking herd. These and the Herefords belong exclusively to the fattening class, and are utterly unsuitable for improving the milking qualities of the herd.

Assuming that the dairyman is satisfied that his land will provide sufficient food, and is otherwise suitable for big stock, and has obtained a Shorthorn bull of an approved milking strain, would it be advisable to recommend the purchase of pure-bred cows? No; sound, healthy, cross-bred cows of the following strains—Jersey, Guernsey, Ayrshire, Red Polls, Devons, and Shorthorns—will meet the requirements of the dairy farmer. It is of the utmost importance that before purchasing any cows you satisfy yourself that they are possessed of the recognised points observed in good milkers.

What points, then, should be looked for to indicate their good qualities as milkers? I would first of all satisfy myself that the animal was healthy, young, and of suitable size; and, if recently calved, see that the afterbirth was not retained. Cows are frequently put into the market with retention of the placenta, and not a few farmers have suffered loss in consequence. Turning to the points: First, face the cow, and look at her conformation; see if she is of the wedge shape—the distinction of all milking strains, and especially so with the ideal Ayrshire. Satisfied that her fore and hind quarters are not of the beef-producing type, glance at the neck, which should not be too thick and short; look at the withers, and notice the slope; if too fat and fleshy, suspect a strain of one or other of the fattening breeds; pay particular attention to the depth of the hind quarters, as her future greatly depends upon this point; if shallow and tucked up, leave her alone, unless other points and price are tempting. Observe if there is abundance of space in the young cow betwixt the hind legs, for the development of the udder. Look for the escutcheon, which is the hair with the upward tendency seen on the buttocks, and which produces a kind of fringe at the line of juncture. Frequently in good milkers the escutcheon is prominent, and extends to the udder and partly over the limbs. Take notice of the size and shape of the udder and position of the teats, and look carefully at the milk veins. Veins of the udder are usually large, and are very often double and appear on both sides, extending along the belly in the form of wavy lines. Examine the entrance of the veins underneath the belly and towards the forelegs, and feel for indentions or holes; if large, such indicates a large return of blood from the digestion and the udder to the heart. Fine, soft hair and skin on the udder are additional favorable points. Do not forget to ascertain if the cow is of good temper, as temperament has much to do with the milking abilities. A good idea is generally obtained from the animal's appearance and movement when handled. By giving the above points one does not mean to infer that you observe all of them in single cattle, but when a person is acquainted with such a guide, it is a speedy matter to apply the points in the selection and judging of milking stock.

Leaving the rich soil and country, what is the best cross for a farm where feed is scarce throughout the year and where cattle have to work to obtain it? Where this exists, a cross between the Ayrshire and Jersey would be found suitable. The cows are small in body, but compact, and are able to turn to good account the feed within their reach. Ayrshire cattle are regarded as the most profitable in seasons of drought, their hardy nature fitting them for the trying circumstances. A drawback, however, is their hasty temper; but, with firmness and kindness, the majority of troublesome cows are made to become quite docile during the operation of milking. Another valuable cross, and one which of late years has come into prominence for their large returns of milk and butter, is the Jersey-Shorthorn. These cattle have given evidence of being especially fitted for districts having a good yearly supply of feed. The vessels of Jersey-Shorthorn cows are usually beautifully placed, with the teats well set apart, making milking easy.

In breeding milking stock on the dairy farm it is a common, but unprofitable, practice to keep the sire for years—in some cases until his fertility ceases through old age or disease. A change of bull is desirable every three years. We are very far behind in systematic breeding and in raising suitable stock for our respective districts and purposes. I have frequently observed herds of large, heavy-framed cows kept exclusively for milk, the weight of the herd being retained or increased by a continual use of heavy fattening bulls of the Shorthorn, Black Polled, or Hereford types. When beef cannot be disposed of at a profit, such a system of breeding is decidedly wrong. Again, I have found small puny Ayrshire crosses being bred to a bull of the same strain, with the natural result that the herd becomes, year by year, more reduced in body, milking qualities, and health. In such instances the introduction of larger bulls of a milking class is warranted to bring up the standard of the herd. Serious injury has been caused to many milking herds in our colony through the use of small, immature Jersey bulls, too many of which are in use, regardless of district and purpose. Where a Jersey is wanted is on a farm with scanty feed and amongst cows of a heavy class, but impoverished, and exhibiting the familiar neglected look, with the tucked-up bodies supported on long, lanky limbs. With this change, the progeny would be shorter, the vessels better shaped, and the animal more in accordance with her environment and purpose on the farm.

From what has been said of the Jersey one must not think she can live on poor country. She belongs to a tender, well cared for family, and her ideal home is on the farm of the independent gentleman.

When discussing breeding it is frequently asked, upon what lines would a person raise the standard of a fallen herd? To accomplish this one must consider the conditions of farm, purpose, and state of the cows. If down in frame and vigor, throw in an Ayrshire or milking Shorthorn, as the case may be; breed only from the best of them, get rid of the worst, and by continuing this for a number of years in a judicious manner the standard of the herd will steadily improve. A number of farmers are working on these lines; and some have provided themselves with milk testers, as a guide in their work. Such farmers afford ample evidence that dairy farming, when conducted on good lines, is as profitable, if not more profitable, than any other agricultural pursuit. As every one is aware, our cows are deficient in quality, and, no matter how careful one may be in the work of the dairy, if the breeding and rearing of the calves are left unheeded, the way to success will always be blocked.

Milk Supply.

We will now turn to the subject of milk supply. As the majority of our large dairy farms are situate near butter and cheese factories, it will certainly be the wish of the farmer to produce a large quantity of rich milk throughout the year. The question will be asked, how can this be accomplished, and what inducement can the factory give to attain this end? First, remember you must have the right strain to put the feed to a profitable use. There is much truth in the old proverb, "Breed for quality and feed for quantity." Unless you have the milking strains your feeding will not produce milk, but meat. Secondly, there must be regulation in the calving. Do not have all the cows coming in at the same time because feed is abundant. Excess means low prices for produce. This leads up to the question of provision of fodder for the cows to successfully carry out such a system, and this matter will be dealt with later on. Thirdly, the factory can give inducement by purchasing milk by the fat percentage. When this system is not adopted the factory is not promoting dairy education and improvement in milking stock.

District materially influences the quality of milk. Where herbage is of quick growth and rank there is immaturity in its constituents, hence softness and slushiness in the milk. This strikes one forcibly when making butter and cheese throughout the colony. Again, where the growth of herbage is slow and the situation is hilly, or even flat with a light limestone formation, the milk and flesh-forming properties of the feed are matured, the milk is firmer, the fats are harder, the natural aroma is more pronounced, and the keeping quality of the product is distinctly higher.

Butter-makers in a district of rank herbage have to contend with the difficulties of quick churning and softness in the butter; hence, granular butter—that is, butter made into grains in the churn—is not usually obtained in a satisfactory condition. The buttermilk is removed under difficulty, and, where refrigeration is not provided, losses in fat cannot be avoided. Turning to cheese-making: The freshly cut curd is invariably damaged owing to softness of milk, and the whey, instead of having the desired green color, is white with the escaped fat and casein from the curdled milk. Sluggishness and softness is observed in the process of cooking, and when the degree of acidity has been reached in the curd, that softness, so objectionable to the cheesemaker, generally accompanies. In the pressing of the curd, fat usually escapes, and the ripened cheese has a somewhat inferior standard of quality. On the other hand, where maturity in herbage is slow and thorough, churning of cream is frequently delayed, firm butter grains are obtained, and thorough washing accomplished; with cheese, curd cuts firmly and is stirred without loss of fat and casein, as shown by the green whey; acid develops steadily, and the curd in the vat possesses a firmness indicative of its good quality.

The difficulties of churning, as given above, can be partially overcome by careful ripening of the cream and churning at a low temperature. With cheese, ripening of the milk is indispensible; careful cutting, stirring, and heating must receive the maker's attention.

A question is frequently asked: Has the drinking water of cows got anything to do with the purity and quantity of the milk given? Practical experience and experiments go to prove that quantity and purity of water influence the quantity and keeping quality of milk. Throughout the hottest summer months cows will not exert themselves to supply their essential wants unless the provision of water is made an easy convenience, and many animals have to be driven to the trough and almost forced to drink bad water before their thirst is satisfied. I have no hesitation in saying that the impure state of drinking water is responsible to some extent for the inferior quality of butter and, without a doubt, for the weakness in the quality of our cheese. If water does not increase the flow of milk, the question now comes, why is it that we obtain an increase in the quantity and also the quality of milk when cows are given sorghum or green feed along with the dry herbage picked up in the paddocks In my opinion the answer to the question is this: When cows are entirely fed upon dry grass there is a deficiency in moisture and an excess in dry matter. Cows will not drink the water necessary—or in addition to what is stated above, it is not within their reach when wanted—to aid in the assimilation or digestion of the dry feed. But when they obtain an allowance of sorghum or succulent feed, what do you find? A distinct increase in the milk flow, and perhaps a slight increase in the quality of the milk. It may be asked, does this change come direct from the sorghum? No; but the sorghum lends a helping hand to the digestion of the dry, matured, and richer feed; and without the green food, injury other than the loss of milk would follow. The digestive organs would be impaired, the food would pass through partially digested, and not only would this be the case, but a portion would remain in the third stomach, increase in quantity and hardness, resulting in impaction, which too frequently is followed by death.

Feeding of Cows.

When treating this subject one is asked, what is the best food for milking stock? The answer is "the natural grass," simply because it contains all the constituents required for the formation of the milk, and also for the formation of flesh, blood, and bone in the animal herself. The answer to this query brings forth the question, what are we going to do when the supply of natural grass is insufficient to maintain our milking stock for more than six months of the year? Dairy farming is not dairy farming at all when provision is not made for the support of cows in the dry months of the year, and where supplementary food cannot be grown, then dairy farming must stop. It is unwise to attempt it in a district where the land, situation, and conditions are opposed to the growing of fodder crops. But the majority of our farms are not so situated, yet failure is found. Why should this be, when we observe farmers who have had the misfortune to settle on unsuitable districts and yet turn to good account their appreciative labors. Such men have been facing privations, and have been compelled to take every advantage of the possibilities of their land. Some have sunk wells at great depth and erected windmills. A patch of ground has been sown out with lucern and irrigated, and thus feed has been provided to carry the cows through the dry season. Others, again, have taken advantage of the silo—winter food stuffs have been sown and cut, together with the rank herbage within reach, and has been stored up, and judiciously given to the cows when required. Some farmers have had hay and straw chaffed, and mixed with a little bran, copracake, and salt, then steamed at night and served out next day as required. We find, on the other hand, farms favorably situated where little or no green stuff is grown though water is within easy reach, or a creek may be passing through the farm. We must all admit that dairying cannot be carried on satisfactorily without provision being made for the support of cows independent of the natural feed, and until this is done failures will continue, and diseases in stock remain unchecked.

As silage is used on a number of farms it may be well to say something concerning its preparation. Not a few farmers have lost quantities by "firing" and by rotting. In the former instance too much heat has occurred through under pressure, while in the latter the outside of the silo has been insufficiently tramped, and with wet silage decay follows, penetrating into the heart of the silage. It is advisible to slightly wither the crop prior to filling in, and as a guide to pressing it is recommended to use a thermometer, placing it into an iron pipe driven into the silo. If the temperature does not rise beyond 120° F. the silage will remain sour; if the temperature rises to 140° F. the silage is known as sweet; if, however, the thermometer goes beyond 140° F. the color of the silage is brown; and exceeding 160° F. it will be overheated, and will possess a burnt flavor and a low feeding value. Sweet silage is to be recommended for milking stock, and cows become very fond of it, probably from the aromatic flavor which it contains, as well as its succulent condition when compared with the dry summer herbage.

Considering the question of root crops on the dairy farm, one naturally asks what crop is of the highest value for milk production? The mangold may claim the position; they are relished by cows, and little or no bad effects to flavor of milk is traceable to their use. The crop is a gross feeder, and responds to abundance of manure. Nitrate of soda and common salt furnish it with what one might call the forcing constituents. In growing mangolds a point worthy of attention by those who are fortunate enough to have favorable land for their growth is the period when the crop is ready for use. Usually they are pulled and given to the cows when full grown, but this is a mistake, as the mangold at this stage is still immature and of a low feeding value, and has a tendency to cause purging. When growth has ceased the roots should be pulled and the leaves removed, or better still, the leaves removed at intervals after growing and before pulling. The tap root must not be broken or injured, neither the crown, else the nutriment will bleed and the bulk rot. The roots should be pitted or put into rows, and covered with earth to ripen, when the pectose and pectin, as they are called, are changed into sugar.

Milk and Milking.

We have now arrived at the question of milk and its formation. It is sometimes asked why the milk of the Jersey breed is so much richer than the milk of the Shorthorn, even when the Jersey is fed upon much poorer food. This is due to the nature of the breed, to the individuality of the animals in making fat in the milk or putting it on as flesh on the body. Feed will not transfer that property in light breeds to any extent, except it be continued for a number of years and skill brought to bear upon the breeding. This does happen with heavy cattle, as has been stated before, but the heavy feeding is usually persisted in, and the calves specially selected for their beef-producing points, and not for their milking propensities. Turning to the formation of milk, one inquires as to its formation in the cow. Such a question is somewhat technical, but the answer throws some light upon the great influence of animal temperament on both the quality and quantity yielded. Opinions differ as to the exact formation of milk in the animal, but we know that disturbance in a cow materially affects her supply and quality of milk. To begin with, we will look to the milk glands which are in the vessel of the cow as the seat of the manufacture, the milk veins as the carriers of the raw material, the blood, and the nerves as regulators of the amount of work done. Looking to breed and individuality, we know that the richer the food given the richer will the blood be, hence we say the rich raw material which passes into the milk glands will be partly converted into milk, the rest of it will be required for the support of the animal's body to be turned into fat as her nature demands. Both the secretion and excretion of milk are under the control of the nerves, and when a nerve disturbance takes place as the result of fright by rough milking, hunting by dogs, or when a dissatisfaction in the cow is brought about by improper feeding, bad water, or exposure to cold, the quantity and quality of the milk suffers. We have many convincing practical illustrations on the farm and in showyard to prove this. All that we need interest ourselves about in the formation of milk is that richness depends upon the good breed and individual nature of the cow, feed goes to form milk as she has the power to utilise it, and abundance of water is the essential for quantity, and that both the quantity and the quality are under the control of the nerves. We ought always to bear in mind that the cow is a very sensitive animal, that her machinery is easily deranged, and that every degree of derangement by either fright or discontentment takes away money from the dairyman's pocket.

I have been frequently asked what influence exposure has got on the yield of a cow's milk? This is a very pertinent question. Exposure not only decreases the yield of milk, but interferes with the health of the cow. It is apparent that when a cow is exposed to cold at night she will require to expend more animal heat to combat the low temperature of the air, and in doing so more food is required; the animal usually spends a part of the night at rest on the cold ground, and can her milk flow be otherwise than interfered with under such conditions?

We now have to deal with the question of keeping the milk free from contamination from outside sources. Upon this depends to a very large extent the success or otherwise of the products to be manufactured from the milk. In the simple process of milking, and the treatment of the milk prior to its reaching the factory, there is a lamentable lack of care shown, resulting in very serious loss to the industry. No scientific treatment can make a good product from a damaged raw material. It is a great injustice to the manufacturer to place him in such a false position when preventive measures are so simple, *i.e.*, thorough cleanliness. Until scrupulous care is taken to prevent contamination the trouble will continue, and even with the general adoption of the system of pasteurisation. it will not be possible under present conditions to secure regularity in the production of first-class products. With the general absence of care the milk becomes infested with dirt, wet and dry, containing microbes which increase and multiply in the milk with marvellous rapidity. They are possessed of the power of turning milk sour and otherwise injuriously affecting it. Before the milkpail reaches the dairy souring has begun, and the more uncleanly the conditions the more rapidly will the milk become acid. Anyone can satisfy himself of the truth of this by means of a simple experiment. Take a small quantity of milk obtained under uncleanly conditions, also a similar quantity where the utmost care is taken to prevent anything dirty gaining access to the milk. Place them both in the milk room, and you will find that the latter keeps sweet much longer than the former, and a careful examination of the sediment when the milk is allowed to settle will give ample proof of the presence of dirt, &c., in the former.

Another important question is, how soon after calving is the milk fit for use in the factory? It is unsafe to use the milk before the fifth day after calving, and in many cases it is dangerous even then. Milk is frequently sent to the factory the second day after calving, with the result that the butter has an unpleasant flavor, and in cheese decomposition is hastened, even if only a comparatively small quantity of such milk is used. The practice of adding preservatives to milk intended for the factory injures the milk for cheese-making, preventing or retarding the development of the required acidity. When milk is scalded or boiled, thickening by rennet is delayed and quality must suffer.

In keeping milk over night, set it in the coolest place available, wrap the cans in clean canvas, and if water is to hand, allow a stream to run slowly over the canvas or place the cans in canvas bags containing water. Cover the open cans with damp muslin to prevent admission of dust. The suppliers to one large factory in Victoria are compelled to provide their cans with a jacket of white calico in the summer to lessen the influence of the sun's rays and heat—a very important matter in our hot climate, and one that might be followed with advantage in this colony.

As pasteurisation has been much talked of of late, it will be well to say a word or two on the matter. Pasteurisation is a wise and safe plan to adopt in all households where milk is bought from the dairy. By the simple heating acid-making germs are destroyed, and if the temperature of the milk is brought up to 185° F. for a few minutes the germs of tuberculosis are unable to survive. Boiling milk is not recommended, as more harm than good is done; the quality of the milk suffers, and the gain over germ life is immaterial when the milk is to be consumed quickly.

Turning to the separation of milk for cream, the requirements of milk towards efficient separation demand attention. Those with home separators ought to separate immediately after milking, as cold milk is of a stiff nature, and the fat globules adhere to the casein of the skim milk and pass away in separated milk. If milk is left over night during the cool winter weather, heat it up in the morning; but when kept in the hot summer weather it must be put through unheated, as thickening would interfere with the removal of the cream. Milk standing over night in a warm condition always develops a degree of acidity, and readily curdles when artificial heat is applied. Speed must be attended to, as a falling off of the number of revolutions of the bowl means a loss of cream. Before and after separating milk it is advisable to run a quantity of warm water through the separator; afterwards take it down and thoroughly clean each part of the bowl separately. Do not put the separator together until immediately before use. Separator refuse must not be given to pigs, as such is frequently accompanied with dangerous germs, and pigs have been known to contract disease from consuming the slime. Where no separator is used and the pan system is practised, set the milk hot and, if convenient, place the pans in larger pans of cold water; the quick-falling temperature usually gives a fattier cream layer. Milk and cream must be kept in a room containing no other articles than those having a place in the dairy. I have traced bad flavors in milk, cream, and in butter to milk rooms where vegetables, fruit, bacon, mutton, and all sorts of foods were stored. The inside of a dairy ought always to show bright, clean, whitewashed walls.

Cream-Ripening.

We come to the ripening of cream; and one inquires if it is advisable to keep the creams separate before churning. When working with small quantities it is strongly recommended to stir each additional cream thoroughly with the previous quantity, for the purpose of mixing the acid and bringing the fresher cream into contact with acid-forming germs. No new cream should be added to the bulk within twelve hours before churning. When the above does not receive attention, sweet, medium, and acid creams when churned will not yield up their fat to be formed into grains of butter at the same time. The acid portion will change first, followed by the medium and portion of the sweet, but the butter-maker stops at the granular stage, leaving a quantity of the sweet cream in the buttermilk. One naturally asks, what is a guide to the proper ripeness of cream for churning? A practical way of ascertaining this is to remove a spoonful of the cream and taste it. If a quick, sharp, acid flavor is imparted to the palate, followed by a sweetness, the cream is then ready. If the flavor, however, is sweet, followed by a slight acidity, it is then too sweet; but again, if the flavor is very acid and objectionable to the taste, imparting a bitterness, it has been kept too long, and bad ferments have set to work.

Churning.

The chief points requiring attention in the manufacture of butter are as follows:—First, a thoroughly clean and well-aired churn that has been scalded with hot brine and sweetened with limewater; second, ripe cream at the proper temperature, 55° to 60°, above 60° fat is usually lost; third, steady churning and ventilation of gases; fourth, the addition of a small quantity of cold water when the cream assumes the first appearance of grains; fifth, gentle churning until the grains are of the size of wheat and free apart; sixth, running off the buttermilk to be replaced with water to the quantity of three-fourths of the churn; seventh, removal of water to be replaced by a fresh supply; eighth, run off and add a solution of brine; ninth, remove the butter, work gently for a few moments, and salt carefully. Work a second time six hours afterwards. Dairy butter becomes rancid because the buttermilk is not properly washed out; it decomposes in the butter and brings about the disagreeable flavor. Streakiness results from improper salting; not working the salt into the body of the butter in a thoroughly dissolved condition.

Cheese-Making.

There are two classes of cheese manufactured in the colony—the acid and Canadian. The Canadian is the more difficult, and requires experience and knowledge to produce a good quality, but the value of the cheese is much above the heavy buttery stuff which we generally find so plentiful What are the chief points in cheese-making on the acid system? There are many points demanding the knowledge of the maker, but, to begin with, you want the suitability of district, and with a good district and a good supply of milk within reasonable distance of the factory the young cheesemaker will be half-way to success. The above has been completely overlooked, and those who go from one place to another find the difference in local conditions affect the result of their work. With a good country the ordinary cheesemaker, by sticking to the general routine in the process of making, can turn out a favorable cheese, but this does not mean proficiency or success. The second half-way journey to success is difficult in the proper sense of the word. To be near proficiency the cheesemaker must be conversant with the principles of botany, chemistry, and bacteriology, and he must not be without a knowledge of the diseases of the cow. Each plays an important part in the detection and discovery of the source of taints, changes in acids, &c.; at the same he must be thoroughly practical, always open to learn, and a disbeliever in the so-called "secrets" of cheese-making, as no such thing exists.

When this is grasped we may proceed to a few points in the making process. First of all, let us begin with the ripening of the milk. In cool weather milk is usually sweet and slow to ripen, causing a delay in the working. This can be overcome by adding sour whey to the body of milk, but the whey must come from a perfect making of cheese, and should not exceed 1 per cent. Second, cut carefully; if not, there will be a loss of fat shown by the milky condition of the whey. Third, stir with hands for ten minutes to avoid damage to curd, Fourth, use the rake very carefully for the same purpose. Fifth, heat steadily. Sixth, allow the curd to settle when a shotty condition is felt. Seventh, run off whey when the hot iron test corresponds with the grit on the teeth; put no reliance on the feel of the hand. Eighth, stir thoroughly to change the acid, but protect the curd against cold draughts at this time. Ninth, salt carefully, and mix thoroughly with the curd, allowing the salt to thoroughly dissolve before hooping commences. Tenth, put into hoops and press well with the hands. Eleventh, when in press apply very little weight to begin with. If curd is over 80° F., and hard pressure is put on, a skin will be formed around the curd, locking in the whey, resulting in ruin to the quality of the cheese. Again, if the curd is cold and too little pressure is applied, the little cubes will not adhere properly together. In discussing the faults, the main question is an inquiry after the cause of cheeses bleaching. This is a fault which I have investigated at some length during the past six months, and have now concluded that the real cause of the mischief is in hooping the curd when too sweet, and permitting excess of whey to accompany it. One may ask why this should do it. Sweet whey in cheese supplies the want of germ life. There is not sufficient acid to check them. They have not done their work in the vat. The hooped cheese will be patchy with whey after pressing, forcing a speedy fermentation in these places; excess of acid will be formed, and bleaching of the annatto or coloring matter will follow the action of the acid, and decomposition will be the final action.

Patchy salting assists in this fault. Remedy—allow more acid to develop, get rid of the whey in the operation of stirring in the cooler, salt evenly, allow it to thoroughly dissolve, and press carefully and steadily.

Can Stilton, Gorgonzola, and soft cheese be manufactured in this colony? Certainly, and for six months in the year no climate is more suited to this manufacture. Rapid changes in temperature are not common, and the average temperature is most desirable to successful making. While engaged in the manufacture of these cheeses during two seasons in England, the great trouble was the rapid changes of the weather; cool and pleasant one day, thundery and sultry another, while in the winter months we did not attempt to make them at all.

Diseases.

Considering the number of diseases milking stock are subject to, the cows of our colony may be regarded as somewhat free from the attack of most of them, except tuberculosis. One reasonably asks why the cows should be more liable to contract tubercular disease? The answer is not far distant; it is easily found and is readily understood. Disease is contagious, and we have already got it. The general health and vigor of our cows is low, the result of bad breeding, scarcity of food, and exposure to cold and damp. When does the disease attack an animal? Invariably when the system is weakened, and when the organs remain as an open field for the germs to attack. Physicians now tell us that the early stages of consumption in the human body can be cured—not by medicine or inoculation, but by what is known as the open-air treatment. It is simple, being merely plenty of dry fresh air and sunlight, and abundance of nourishing food. How can it effect a cure? Because it brings up the strength of the body, the strength of the blood, and the strength of the organs, so that the vitality of the organisms of disease can no longer battle against a stronger invasion. We, however, cannot put our sickly cows into a sanatorium to be cured, but we can prevent our cows from becoming tuberculous. First of all, by laying a strong foundation in the body through proper and healthy breeding; second, by feeding well, to maintain the vigor already begun; third, by providing shelter, to protect the constitution now built. One hears about the great germicide, the sun, and that tubercular disease cannot be prevalent where its influence is keenly felt, and where cows are unsheltered. The mighty germ killer is badly crippled when our cows have, for five months of the year, to accept the cold, often wet and unprotected ground for a bed.

What may the symptoms of tuberculosis be? There are many so-called symptoms, but the most convincing, and worthy of the farmer's attention, are lumps in the throat, stifled breathing, cough, and lumps in the udder. When any one of the above is observed, and more especially when accompanied with emaciation and a vacant look, care is wanted with the animal's milk. Have the cow isolated and examined, also, the milk microscopically analysed.

Is Tuberculin Infallible?

Tuberculin is not infallible. Professor McFadyean, Dean of the London Veterinary College, states that the strength of tuberculin will vary as certain substances of ill-defined chemical composition which are in tuberculin as the result of the growth of the living bacilli are not constant, and that this chemical substance is the active ingredient of the tuberculin which brings about a reaction in an animal; hence a quantity of it which produces no appreciable effect on a non-tubercular animal excites a short but sharp attack of fever, manifested mainly by a rise of temperature, in one that is tuberculous. If tuberculin is too strong it may cause the temperature to rise in a healthy animal, and if too weak it may fail to bring a reaction in a tuberculous animal. A rise of temperature may take place during the fifteen or eighteen hours after the injection, and yet be due to a cause other than tuberculosis. Again, the reaction is measured by the manner in the rise in temperature, not in the amount that the temperature ascends. A confident case of disease in an animal is when the temperature begins to ascend a few hours after inoculation, and gradually rises two or three degrees, the maximum point being reached about the twelfth or fifteenth hour; afterwards it gradually falls to normal. Sudden ascents followed by sudden falls of temperature must be put down to some accidental disturbance. Excitement and strange surroundings will disturb the bodily temperature of an animal, and failures in tests are met with when tubercular disease is far advanced. Cows which have not reacted ought to be tested at intervals, as between the moment an animal is infected and the formation of actual lesions in the part to which the bacilli have gained access—the lungs, for example—a certain time must elapse.

Authorities state that there is risk of error to inoculate cows when in season and their temperature somewhat fluctuates. Why cows advanced in tubercular disease do not react to tuberculin is supposed to be due to the infected animal becoming so accommodated to the presence of the microbe and its products that a further injection does not result in any marked systematic disturbance. Professor Bang puts the reliability of the tuberculin test down to 87 per cent. and not to 98 per cent., as is generally claimed, and therefore he disagrees with Nocard, who claims that in every case when tuberculin indicates tuberculosis that it can be found if looked for with sufficient care. Nocard agrees that there is a stage in the period of incubation when it is too early for the tubercle to have formed, yet the reaction shows the presence of the disease, but it is impossible to define that stage. This is opposed to McFadyean. From the views of those eminent scientists we must look upon the tuberculin test as an operation to be performed by a qualified man alone, and not by any person who is unacquainted with the delicacies of the test. Tuberculin is prepared by growing the bacillus in a glycerin bouillon; it is then sterilised, and after concentration is filtered through a porcelain filter, and is ready for use. Much importance must be attached to the source from whom the tuberculin is procured.

Milk Fever.

This disease generally attacks well-bred milking stock, and Jerseys and Shorthorns are more liable to it, likewise cows in high condition and heavy milkers.

Symptoms.—Evidence of disease is shown in from twelve to thirty-six hours after calving, and the symptoms are recorded as follows:—Cessation of rumination, dullness, lowering of the head, arrest of milk secretion, paddling of the hind feet, and a rolling and unsteady gait when walking, staggering, and paralysis, and usually the animal falls helplessly to the ground, head is frequently turned towards the flank, and rests on the side, eyes are half closed, and the cow falls into a sleep, pulse is quick, and breathing heavy, temperature may be as low as 95° F.

Treatment.—Prevention is better than cure. Keep the cow in average condition up to date of calving, and give laxative medicine prior to calving. The curative treatment, and the one adopted with considerable success by the old Scottish farmers, was whisky, and to-day whisky is still looked upon by Scottish breeders as the best and safest specific. A renowned veterinary surgeon in Scotland lately sent me the following prescription, and it is regarded as superior to the whisky alone:—Give twelve nobblers of whisky in water, followed with 1oz. of chloral hydrate in water and ½oz. doses of chloral hydrate every three or four hours afterwards. Keep the animal well on its belly, and turn over occasionally, milk often, only taking away a little at a time.

There is another form of milk fever which is sometimes confounded with the disease explained. It may occur up to the eighth day from calving. The cow may calve satisfactorily and look healthy when dullness follows, appetite fails, and later on shivers appear, pain is evident, animal stamps her feet, kicks the belly sometimes, and repeatedly lies down and rises up, hind feet are often drawn towards the abdomen, vulva is swollen and the vagina hot and tender. The mucous membrane of the vagina is sometimes spotted, ulcerated, and intensely red and inflamed. Upon the first appearance of this trouble attention is directed to relieve constipation if present. Further treatment must be put into the hands of a veterinary surgeon. Cows dying of metro-peritonitis ought to be burned, as pregnant animals are liable to contagion by coming into contact with any diseased portion of a dead animal

Impaction.

This trouble has carried off a large number of milking stock during the past few years. It is due to stomach weaknesses; want of abundance of water and succulent food during the dry months, causing injury to the nerve actions of the bible, the food remains between them, and frequently the skin is peeled off. A cow having recovered from a bad attack of impaction is very liable to take it again, but in a more severe form when a cure is beyond reach. It will pay to ward off this disease by providing green feed for the cows which aids in the digestion of the dry fodder. When constipation is first observed in a cow she should immediately receive treatment, and it is only in the early stage that real success is attained. Symptoms—Constipation, fullness of the abdomen, grunt in the breathing, disinclination for food, milk flow stopped, thirst, bad breath, staring coat.

Treatment—16ozs. of Epsom salts, 2ozs. of tincture of gentian, 4drms. of aloes, given in 2qts. of linseed gruel, to be followed at intervals with doses of linseed.

Cows very often suffer from dyspepsia The cause of the trouble is scanty feed, exposure to cold, and bad water. Symptoms—Irregular and diminished appetite, becomes worse, and the animal shows a desire to lick walls, stones, and woodwork, takes up dirty straw, sand, stones, &c. A special craving appears to exist for bones. The cow may exhibit rheumatism, and the bones' fibrous tissue may become the seat of the disease. A trouble which is not uncommon is softening of the bone, and, like bone stiffness, a deficiency of phosphates in the food for the requirements of the bone may be said to cause the disease. It is recommended to give finely-ground bone along with bran, chopped hay, and salt. When affected with stiffness, animals usually draw the hind legs when walking, the joints swell, and movement appears very difficult.

Hoven.

When cows gorge themselves with green lucern, cabbages, clover, or sorghum the rumen, or first stomach, becomes swelled by the accumulation of gases. The left side exhibits a greater enlargement than the right. When hoven is first noticed relief may be given by dashing cold water over the body, and by gagging. In bad cases it is advisable to pierce the stomach, the place on the left side being taken at midway between the last rib and the haunch bone, and 5in. from the spine. The following medicine is sometimes given:—Liquor ammonia, 1oz.; cold water, 1qt.; essence of ginger, ½oz. Mix and administer carefully, when the trouble is not advanced.

Retention of the Placenta, or After-birth.

Causes.—Debility preventing proper contraction of the uterus, poor quality of blood, long journeys by road prior to parturition, exposure to cold.

Treatment.—Epsom salts, 8ozs. to 10ozs.; gentian and ginger, 1oz. each, to be followed up in twenty-four hours afterwards by a 2oz. dose of sweet spirits of nitre. The above is one of the best prescriptions yet adopted. If the placenta is not removed by the medicine, then apply the hand, but much care is required in doing so.

Spotted Teats.

Cows are sometimes troubled with hard red spots on the teats, which give rise to considerable irritation and inconvenience in milking. With animals afflicted it is advisable to milk them last, afterwards applying the following mixture to the teats:—Crude "sanitas" oil, one part; glycerine, four parts; olive oil, six parts. Milkers must exercise care in not spreading the trouble to the unaffected cows.

Lumpy Jaw, or Actinomycosis.

By some authorities this trouble is believed to be communicated to susceptible animals by their food. In abscesses accompanying the disease there has on several occasions been found barley awns, pieces of straw, and husks of cereal crops.

Upon examination of a tumor yellow and colorless grains are observed in large numbers, which is characteristic of the disease.

Treatment.—In the early stage dress the tumor with a solution of iodide. Iodide may be given internally, but with large animals the dose should never exceed 3drms.; when driven for a week, 2½drms. daily. With this treatment cows go off their milk. Heavy doses of Epsom salts has the same effect. Applications of ammonia are said to check actinomycosis.

Blind Teats.

This is exceedingly common in our colony, and few herds are free from imperfect teats. It is due to an inflamed condition of the inner membrane of the teat, which takes place when the cow is being put dry; at least I know that it is invariably found when the cow calves. It generally assumes one of two forms—sometimes a small hard tumor is found at the root of the teat or in the teat itself. When this has formed little can be done by surgical interference, as inflammation of the whole udder is liable to follow. As a preventive, milk thoroughly and carefully when putting dry. I regard this as the root of the whole question.

For detailed information in butter and cheese making, see *Journal of Agriculture* numbers for August and September, 1898.

NOTES ON VEGETABLE-GROWING FOR NOVEMBER.

By George Quinn, Horticultural Instructor.

The sudden changes of temperature which occurred frequently during October have proved detrimental to most early crops of summer vegetables.

In exposed situations the cold cutting winds have damaged young bean plants severely.

On the plains country a successional sowing of all of the melon family should be made, and as this season is somewhat advanced, every chance should be given to the late starters. A plentiful supply of well-rotted stable manure, worked into the soil prior to sowing, and occasional doses of liquid manure when developed leaves appear, are the best means to secure this result.

Most melons thrive in humid temperatures, and overhead watering, by means of sprinklers running very gently, when the sun is not too hot, bring about such conditions pretty successfully.

Sowings of dwarf and runner beans will be continued. I wish to repeat again the need for covering the seeds with pulverised manure if a good even germination and stand of plants is hoped for.

These do not require richly nitrogenous manures, such as "fat" barnyard manure; but good results accrue from the use of phosphatic manures, such as superphosphate.

A good plan is to sow the seeds in the drill, cover them lightly with soil, on to which a thin sprinkling of the super. is dusted. On top of this spread the manure mulch.

Potatoes and onions will be harvested on the plains. The latter should be put away carefully as soon as dug, to checkmate any attacks of the potato moth. The keeping onions require to be handled carefully.

Every oniongrower should select a few of the best bulbs for the purpose of obtaining reliable seeds, and before the flowers expand a finely-meshed cheese-cloth should be wrapped around the heads—not touching them—to prevent hybridisation with inferior sorts.

The sowing of Red and Silver beets, and lettuces, cresses, and radishes, for salad purposes, will be continued. The three last-named, should be sown in shady, cool positions. Given abundance of water and liquid manure to force them, these salad plants may be grown fairly well on the plains; but the cool, damp gullies of the hills are the main sources of supply for the summer months.

Tomatoes are now pretty well advanced, and those trying to secure good early fruits should keep the flowerless side shoots pinched out, and the main shoots tied up firmly to supports.

When the ground is warm in summer, the fruits almost resting upon the ground ripen most evenly, but in the spring, a wall or close fence on the south side, to reflect the warmth, gives best results upon tomatoes staked fairly well above the surface. There is time now to set out young tomato plants for bulk crops. Egg fruit and capsicum plants should also be set out.

Asparagus plants should now be allowed to make unchecked growth, and dressings of potash and soda manures, as well as a surface mulch of decayed stable manure, could be applied to them advantageously.

In dry localities, good soakings of water should be given immediately after these manures are spread.

In the hills pretty well all kinds of vegetables will be grown upon the rich, sheltered flats, sowings and transplantings following each other somewhat like they do in early winter on the plains, with the exception that summer and winter vegetables are not so clearly defined as on the plains.

With the advent of warm days evaporation will be enormous, and to counteract this loss of moisture the surface soil between all growing crops of vegetables should be frequently stirred, more especially after rain showers or irregation.

ORCHARD NOTES FOR NOVEMBER

By George Quinn, Horticultural Instructor.

Very much of the routine work in the orchard during November will coincide with that suggested in last month's notes, such as cultivation, disbudding, (see illustrated article in this month's issue), where not already performed, transplanting young citrus trees, thinning fruits (more particularly apricots and peaches), budding (applied chiefly to citrus trees), and planting guavas and passion fruits. These items were all dealt with in last month's issue.

In drier localities watering will be beneficial to stone fruits, and apricots may be improved very greatly by a good soaking.

Newly-planted trees will require careful attention in this respect, as it must be borne in mind their roots are near the surface, in fact may be said to be in the dry surface layer. Although I do not advocate bringing the roots of fruit trees up to the surface, a mulch of manure of litter will help young citrus trees to tide over the first summer by retaining moisture and shading their root systems. If this system is persisted in during the after years of growth it will most certainly bring the roots to the surface, and render them liable to checks from periodical droughts.

The harvesting of early fruits, such as loquats, strawberries, and early cherries, will be well in hand now. Loquats are very scarce this season in many orchards, but strawberry crop reports are favorable. It is a cause for wonder that more early cherries are not tried in favorable spots on the plains and sunny slopes.

It is surprising how these early fruits are benefited and improved in size by a good soaking just prior to changing color.

Those growers who have lemons ready to gather—just tinging with yellow—would do well to cure and keep them for a month or two. It is useless to store lemons when they are quite yellow. They may keep fairly well in a cool cellar, but decay very rapidly as soon as brought into a warmer atmosphere.

The curl-leaf fungus has been very abundant upon peach and nectarine trees in some gardens, but on those trees sprayed with Bordeaux mixture as the buds began to expand very little has been noticeable.

Further spraying with Paris green should be made to check codlin moth ravages. The bandages used in trapping codlin caterpillars will require close attention upon the plains as the month proceeds. The first of these insects usually begin to quit the damaged fruits upon early sorts of apple and pear trees about the middle of November on the plains, but are, no doubt, several weeks later in the hills. A piece of sacking about 8in. wide, sufficiently long to encircle the trunk or limb completely, folded double, strained, and pinned—not to the tree—but into the bandage, with a wire nail 1½in. long, makes a very satisfactory trap. The ground around infested trees should be kept clean of growth, and all sticks, stones, &c., removed. Of course, in well-kept orchards the surface will be pulverised, and no harboring rubbish left about the trees.

The ties upon previously budded or grafted trees should be attended to, and loosened where good growth has begun. All suckers or water growths below the buds or grafts should be suppressed as soon as observed.

FRUIT TREE PRUNING.—No. 7.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Summer Pruning.

The whole of this series has been devoted thus far to pruning during the dormant season; but, to obtain the most uniform results, it is necessary with many kinds of fruits to prune while the trees are in active vegetation.

Summer pruning is a misnomer, as the context will show. The work in its varied phases is performed from early spring until late summer, according to the kind of tree operated upon or the object sought.

The European term "green pruning" is far more accurate and expressive.

To simplify matters I propose placing the various operations performed under this heading in the order in which they would most likely be applied to a fruit tree, beginning at the period of its transplantation into the orchard.

(1) Disbudding, to shape the tree, by selecting those shoots destined to form the main arms, and encouraging them by removing others which would check their progress.

(2) Pinching off the terminal points of shoots to temporarily check their extension.

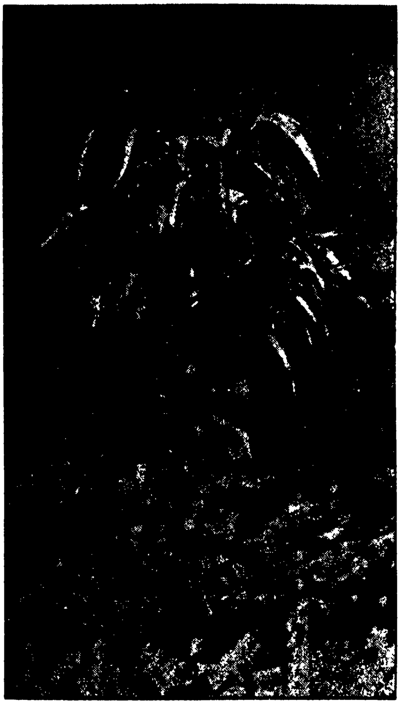
(3) Disbudding to reduce the overcrowding of fruit-bearing wood.

(4) Shortening in wood which has been left to carry fruit, but which has failed to do so either wholly or in part.

(5) Fracturing, to induce the formation of fruit-bearing spurs.

In the early manipulation of young trees, such as the apricot, the main branches of which are liable to split away from the trunk in later years, it is desirable, as far as practicable, to separate the points at which the main arms emerge from the trunk. This can frequently be done when a good number of buds start simultaneously from the trunk by simply rubbing out about every alternate one. Owing to the upper buds receiving most sap, they will almost invariably grow more rapidly than the lower ones, but this can be regulated by the adoption of the second practice in our synopsis, viz., pinching off the terminal sappy points of the dominant shoots from time to time.

In Plate LXXXII. a young peach tree planted in the winter of 1897 is shown. Its first growth of shoots from the main stem—which was cut off about 20in. from the ground on being set out—is seen in a natural condition.



LXXXII.—YOUNG PEACH TREE—FIRST SPRING GROWTH AFTER PLANTING.

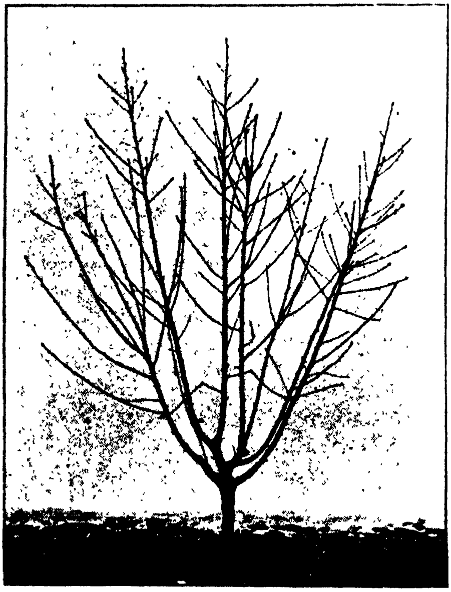
LXXXIII.—SAME TREE WITH LOWER SHOOTS REMOVED.

Plate LXXXIII. shows the lower shoots removed and the upper ones retained. This could have been done by the winter pruning, but the amount of wood to be sacrificed would be greater, and the wounds made would heal less quickly.

Plate LXXXIV. shows the same peach tree as it stood, about 5ft. high, prior to the winter pruning in 1899—nearly two years later.

It will be noticed, in this instance, that the shoots not actually required for the formation of main arms have been rubbed off absolutely. In comparatively cool districts and with some kinds of trees—such as peach and nectarine—this practice is safe. In places, however, where the sun shines very hotly in early spring, or upon trees with close, smooth bark, such as the cherry, apple, and plum, the method of retaining all the lower shoots is best. Restricting their extension from time to time, as shown in Plate LXXXV., by pinching off the sappy growing points is desirable and necessary to the proper development of the tree. These shortened growths assist in the vegetative functions of the tree, keep the bark free, and the sap active, as well as affording excellent shelter from the direct rays of the sun and the drying effects of warm winds. In Plate LXXXV. the central shoot is rapidly outstripping its fellows; consequently, to enable them to catch up, the growing point at P has been nipped out.

Plate LXXXVI. represents an apple tree planted in 1896. The stem being set too high the lower branch W was retained when it emerged the following season, with a view to reducing the height from the ground to the main limbs.



LXXXIV.—YOUNG PEACH SHOWN IN PREVIOUS ILLUSTRATION TWO YEARS LATER.

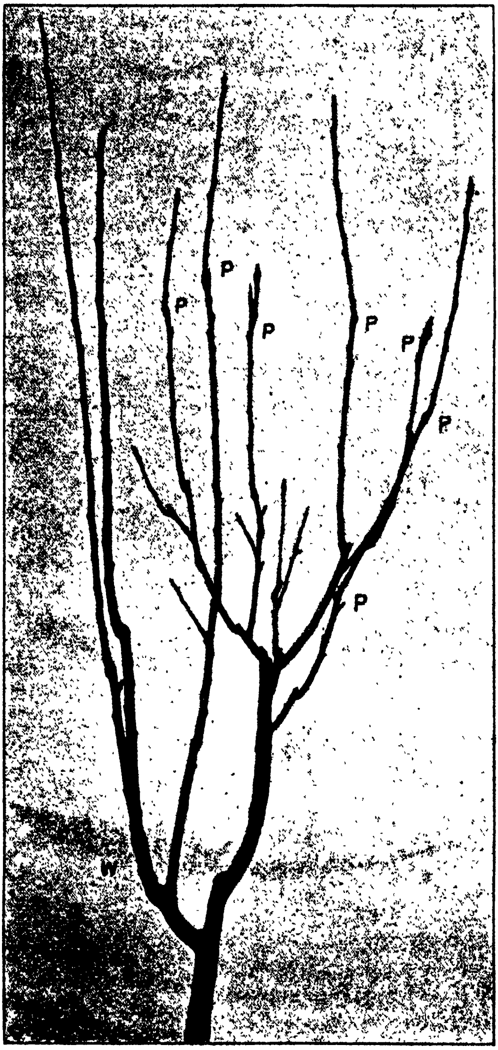
LXXXV. — YOUNG SHOOTS PINCHED AND RETAINED TO SHADE LOWER PORTION OF TREE.

This shoot W was weakly, and placed at a great disadvantage, but by persistently pinching the upper and stronger growths during the growing seasons of 1897 and 1898 at the places marked P the weaker shoot—now sub-divided into three shoots—was gradually brought up to the desired state of equality with the others. It will be noted that whilst these weak shoots were encouraged to make all the growth possible during the growing seasons they were pruned severely each winter. The sturdy character of shoot W and its sub-divisions show the value of this. If this had not been deemed necessary, instead of pruning all the shoots pretty well on a level (see Plate LXXXVII.) in June, 1899, I could have levelled the sub-divisions of W off as high as the other shoots a year sooner, but they would have been spindly and weak. At the time of writing the growths arising from all the shoots upon the tree are fairly even. If any advantage is noticeable it is upon those emerging from the sub-divisions of W now.

Another difficulty which sometimes confronts beginners in training young trees, more particularly the apple, is shown in Plate LXXXVIII. After the winter pruning, when sub-division of the main shoots is desired, it often happens that only one bud—usually the topmost—starts to grow in the spring. If left alone it will continue to lengthen, and its lower companions, if they start at all, only reach a short spur-like development.

Fig. 1 illustrates the above difficulty, and Fig. 2 shows its solution. By pinching out the growing point at P, when the top shoot reaches about 6in. in length, and probably again when it starts to grow vigorously, the other bud or buds lower down receive a greater share of sap for the time being, and make up leeway.

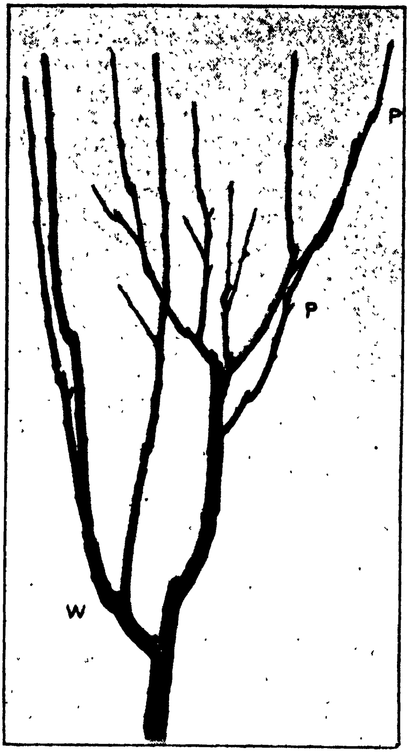
In connection with pinching to apply a temporary check to any dominant branch, it must always be remembered that when a growing shoot is severed at a point where the growth is fibrous and fairly mature the wound will heal rapidly, and growth recommences in a very short time. So, to attain his object, the pruner must always be careful to remove only the brittle cellular growing point with thumb and finger. A glance at Plate LXXXVI. will show that the shoots pinched in this manner do not multiply into useless sub-divisions when growth is resumed.



LXXXVI.—YOUNG APPLE TREE SHOWING RESULT OF PINCHING BACK TO SECURE WELL-BALANCED TREE.

The vigorous winter pruning usually found necessary to maintain a furnished condition upon peach, nectarine, apricot, etc., frequently causes a number of superfluous shoots to arise from the main limbs each spring. This is more noticeable, and requires more attention upon the two first named on account of their fruit shoots not being permanent spurs. A peach tree framed upon the lines shown in Plate LXXXIV. will possess a limited number of main arms and room for laterals to develop upon them.

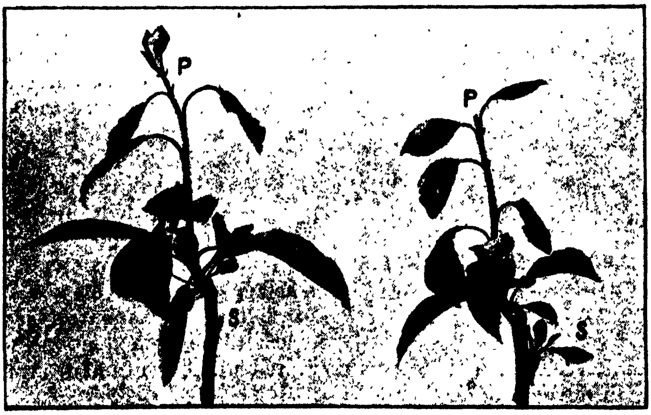
Plate LXXXIX. is a portion of a main limb cut from a similar but slightly older tree. In a length of about 18in. nine shoots have emerged. If these were permitted to remain they would become crowded, and, owing to shutting out the light, would grow drawn, long, and weakly. The lower buds would remain undeveloped, and the fruit buds for next season would be formed on the extreme ends. Besides this the tendency would be for some to be choked out of existence by stronger adjacent growths. The neglect of disbudding at this stage is doubtless one of the main causes of the rapid dying out of laterals upon the lower limbs of peach trees here. In Plate XC. I have shown the same limb with all the shoots marked S suppressed, and at the later stage possibly one or two of those marked R would be removed. In examining simlar shoots it will be noted that those set upon the upper surface of the parent branch usually exhibit a tendency to outstrip the growth of their fellows located upon the sides or underneath the parent branch. This shows the advisableness of retaining wherever possible the shoots with equal opportunities of obtaining nourishment and light.



LXXXVII.—PREVIOUS TREE AS WINTER PRUNED.

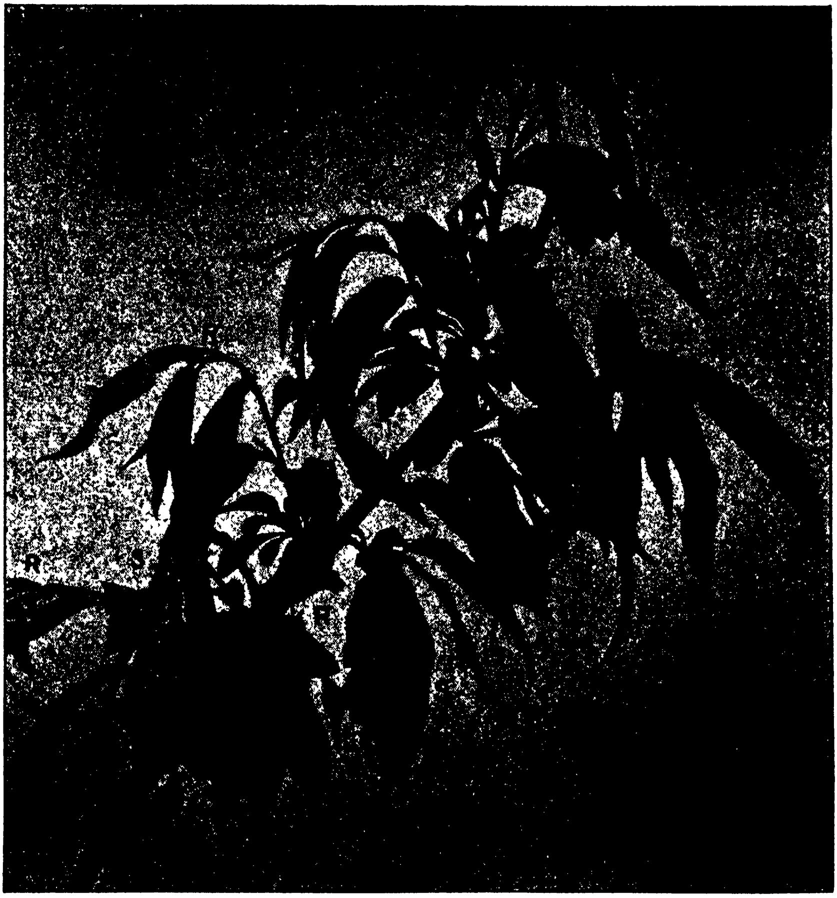
The peach and nectarine also require much attention in the direction of shortening back towards the parent branch wood which has been left for fruit production, but has failed more or less to fulfil expectations.

On Plate XCI. two common instances are reproduced. Fig. 1 is about 15in. long. More than half of its length is wholly devoid of fruit and partly of twigs. There is nothing to be gained by such undue extension. It will be noticed that the two twigs marked 1 and 2 nearest to the base, and another marked D have no fruits near them. The other three, marked P, each have a fruit at its base. The old shoot should be shortened back to the growth emerging at the top P, and the barren shoot D should be rubbed off. This



LXXXVIII.—METHOD OF SUMMER PRUNING OF THE APPLE TO START DORMANT BUDS.

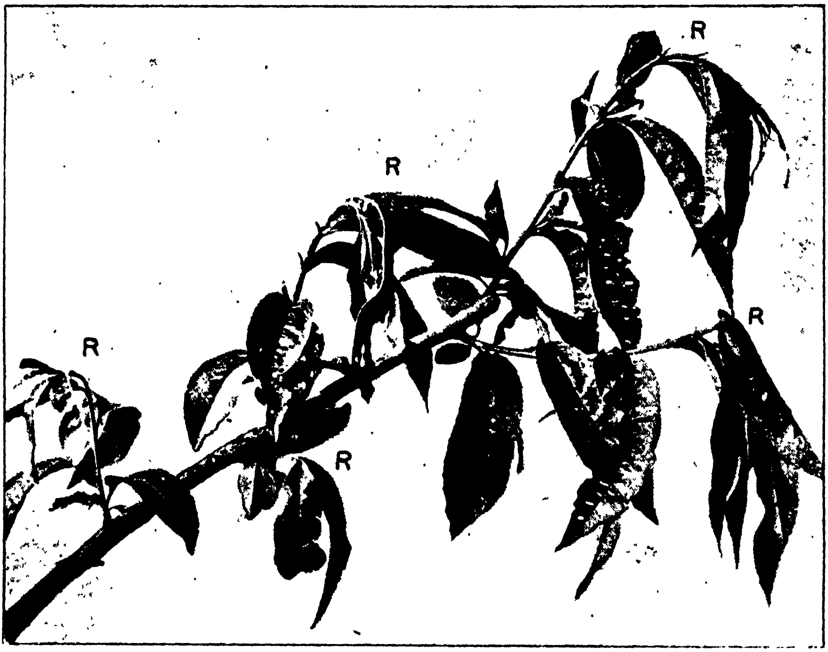
will usually cause base buds where the old shoot joins the parent branch, just below twig 1, to grow. If they do not grow the shoots marked 1 and 2 will be retained at the next winter pruning to continue to furnish fruit-bearing wood. The forcing of base buds into growth can be assisted by pinching the growing points out of the shoots retained upon Fig. 1 from time to time, as previously explained, but under the conditions prevailing in this colony such repeated attentions are scarcely practicable where many trees are grown.



LXXXIX.—PEACH BRANCH SHOWING THE USUAL OVERCROWDING OF SHOOTS.

Fig. 2 in same plate shows a shoot left for fruit-bearing, but it has failed to set any; consequently, to prevent crowding and much pruning next winter, such barren shoots—unless required to fill gaps in trees—should be shortened back to the two buds nearest to the base.

Plate XCII. shows these two shoots pruned as related above. The shortening back should not be performed until the fruits are well "set"; otherwise the forcing of growth from the shoots located at their points of adhesion would most probably cause some of them to be shed. The last phase of this work, viz., fracturing shoots to induce the formation of fruit-bearing spurs, is applied chiefly to the pip fruits, such as the apple and pear, but sometimes to the plum also. For the first few years after being set into the orchard these trees under favorable conditions make very strong growth indeed. The hard winter pruning needed to form a stout-limbed tree aggravates this tendency, and causes almost every bud which grows to become a long and slender shoot. Cutting these again the next winter only increases the difficulty by multiplying the number of rank shoots. Of course the leading shoots must be cut back fairly short for several winters to secure shape and stability, but it is a mistake to treat lateral shoots likewise, for the reasons given above. Recognising the difficulty of overcrowding the branches, many pruners entirely suppress most of the lateral shoots and leave the lower portions of the main arms and branches quite bare and unproductive. A better plan is to retain a reasonable number of these laterals and transform them, by means of fractures made near their bases, into short stubby growths, which eventually become fruit-bearing spurs.



XC.—BRANCH IN PREVIOUS ILLUSTRATION AS DISBUDDED.

No fixed time can be set down for this operation, beyond stating that when the summer is waning the shoots will be in a condition favorable for the work. The pruner should try to note the time when growth is practically done and the sap has begun to recede.

The lateral should be either broken over a knife-blade or between the fingers, above the second or third bud from its base. It must not be severed completely, but merely broken half through and allowed to hang down, as shown in Fig. 1, Plate XCIII. The hanging portion remains green, and assists in the vegetation of the tree, and absorbs a certain quantity of sap, thus enabling the buds upon its unbroken base to develop into short stubs, but checks further development into long laterals should the supply of sap be moderately large.

If a late rain occurs, and the tree is stimulated to second growth, it may be necessary to rebreak any strong laterals arising from the buds designed to be spurs. In the treatment applied during the following winter care must be taken not to make a clean, quickly-healing section below the fracture. This would cause the topmost spur to lengthen into an unwieldly lateral, and the pruner's object in causing the fracture would be defeated.

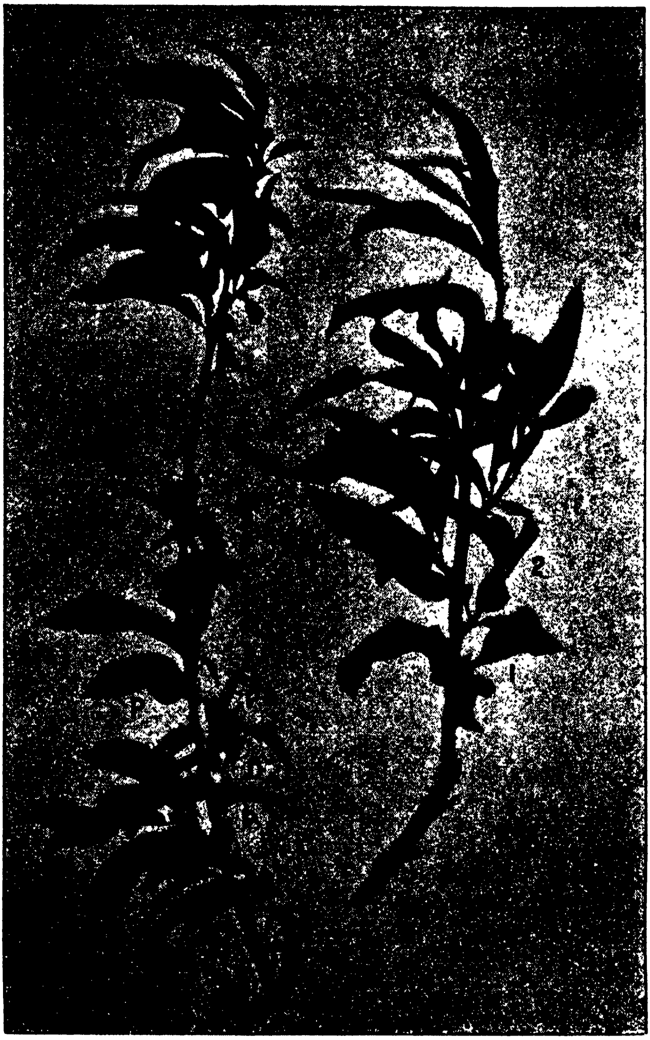


FIG. I. FIG. II.

XCI.—SHOWING BARREN GROWTHS ON PEACH LIMBS.

Fig. 2, in our illustration, shows a fracture below which two spurs formed, but the topmost one has lengthened the following summer. The work has not been wholly lost, as the spurs are set in fairly good numbers on this upper portion.

Fig. 3 shows a lateral which was fractured too early in the season, and the picture explains itself.

A cleanly-cut section that completely severs the lateral, though made at an appropriate time for fracturing, has a very similar effect to that seen in Fig. 3.

In Plate XCIV. the after-effects, when the fracture has been made at the proper season, are seen.

For the purpose of photographing the original shoots natural size it was necessary to remove all of the leaves from them, and 15in. of growth has been severed from Fig. 3 in Plate XCIII.

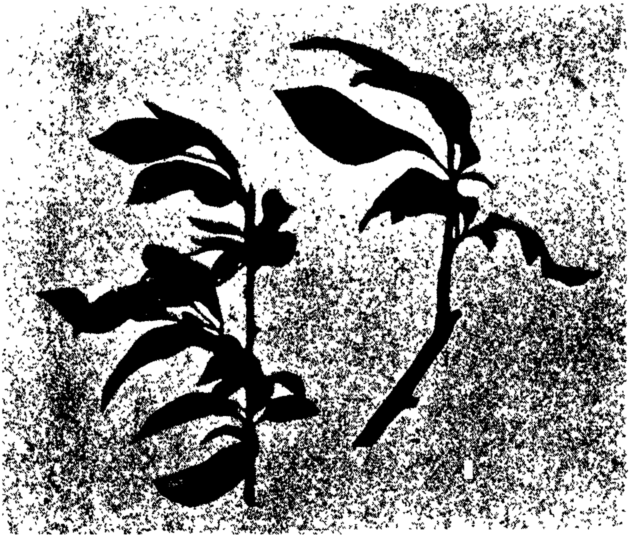


Fig. I. Fig. II.

XCII.—BARREN GROWTH SHORTENED IN TO REFURNISH WITH FRUITING WOOD.

This method of inducing fruitfulness, as applied to young pip fruit trees, is to be commended to our orchardists, in that it not only saves time in winter pruning, but will ultimately place much fruit where it is safe from storms and within easy reach in harvest time.

This is a practice which can be cheaply applied, and in most seasons one operation suffices. The tedious attention required in constantly pinching back the growing laterals as recommended and practised in Europe in the formation of fruit spurs upon pear trees could not in all probability be adopted here by by commercial orchardists owing to the cost of labor, but this practice will actually conserve labor as well as the energies of the tree.

In support of the contention that it is a labor-saving practice, I may say that I made a test of this upon two pear trees of equally vigorous habits of growth, planted about six years previously. The strong laterals upon one tree were broken, as described herein, during January, those upon the other were left intact. The winter following I carefully pruned these trees. The tree upon which the laterals had been fractured took ten minutes to prune, while the other occupied upwards of thirty-five minutes, and the result has proved far less satisfactory.

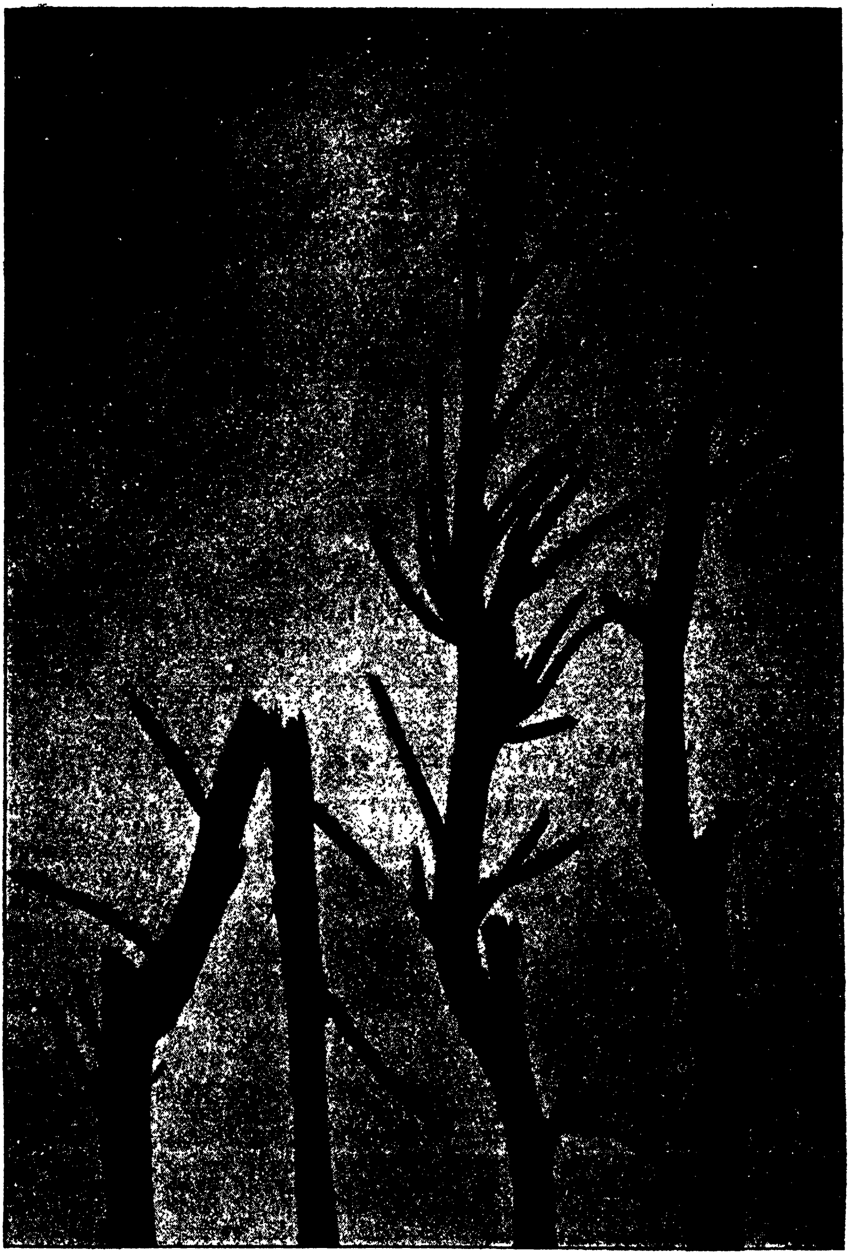
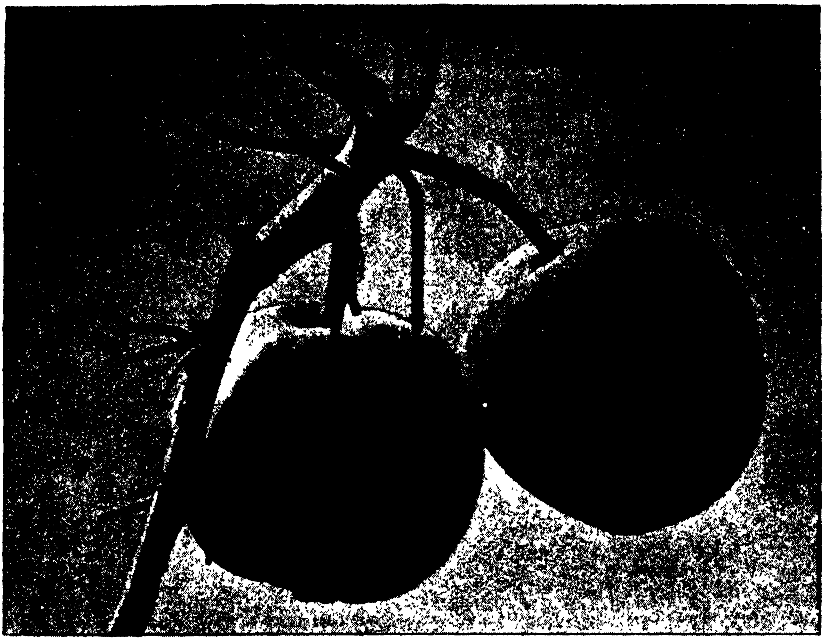


FIG. I. FIG. II. FIG. III.

XCIII.—BREAKING OF LATERALS TO INDUCE DEVELOPMENT OF FRUIT SPURS.



XCIV.—SUCCESSFUL RESULTS FROM BREAKING OF LATERAL GROWTHS.

WINE AND CELLAR NOTES.

By Arthur J. Perkins.

With the incoming of November wine cellars begin to assume the normal summer temperature, and as a natural consequence young wines require to be racked off their lees for the third time. It will, of course, be unnecessary at this time of the year to rack any but last vintage wines. As the temperature rises the loss by evaporation will considerably increase, and it becomes necessary to visit all casks at frequent intervals in order to keep them full. Small casks should be filled during the summer twice a week and large casks once a week.

⁂ ⁂ ⁂

I notice that the French vintage, which at the time of writing should have been completed, is estimated at 1,072,500,000galls., distributed as follows:—

	Gallons.
France	968,000,000
Algeria	99,000,000
Tunis	5,500,000
	1,072,500,000

⁂ ⁂ ⁂

Some idea of the age of the average wine drank in France may be gathered from the fact that calculations are already being made as to the amount of this wine that will be absorbed by visitors to the 1900 Exhibition! When official returns are published showing the actual amount of wine made I shall submit it for the consideration of readers of this *Journal.*

⁂ ⁂ ⁂

A French journal (*Revue de Viticulture*) draws attention to an improvement on the ordinary sulphur rag used for sulphuring casks. These rags, as those who have used them know, are apt occasionally to fall into the cask, whence they are somewhat difficult to remove. Small sulphur pills are now on sale in France, which are burnt in a specially-made spoon, which it is said does away with these objections.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J. Perkins, Government Viticulturist.

The past month has been exceedingly disastrous to vine-growing interests. After eight years of comparative immunity we have again had a black frost towards the end of October—25th of October—and the sad havoc that has followed it will be remembered by growers for many years to come. There is no doubt but that in most places the vines were making fine vigorous growth, and from all appearances the crop promised well. Now the least said of it the better; there will be but little left for the vintage.

It may not come amiss to distinguish here betwixt common hoar frosts, due to local radiation, and what is known as a black frost. The former are due to purely local phenomena: a clean sky and radiation of heat towards the cold inter-planetary spaces. The latter, far more general and searching in their effects, are caused by factors that cannot always be determined. As a general result, however, they bring about a return of cold wintry weather, that affects not only a district or locality, but a vast expanse of country, as has been the case in the instance we have under consideration. Smoke-clouds may with advantage be used for combating purely local hoar frosts, but against black frosts absolutely nothing, I am afraid, can well be done. Wednesday night set in dull and cloudy; similar weather prevailed in the morning, and yet the thermometer went as low as 26° F. at the College. Under the circumstances nobody, I believe, could have anticipated a frost.

In most cases it is merely the leaves that are burnt off, though generally the growing tip as well has been destroyed. In some few cases, particularly on weaker vines, the shoots have been completely burnt up. Where good wood is required next year, and the fruit branches have already been sacrificed, it will be advisable to cut back the shoots to short spurs, so as to encourage good new growth. It is yet early in the season, and such a practice will generally result in yielding at least good wood for the following season. This practice is more particularly to be recommended in the case of rod-pruned vines, where good healthy shoots of some length are absolutely necessary. If it is not done the bare shoots will give rise to innumerable weak laterals and assume an exceedingly weak bushy growth. Further, such a treatment will probably result in a tolerably satisfactory second crop.

⁂ ⁂ ⁂

I notice that in his address to Congress the Chairman of the Agricultural Bureau persists in advocating the introduction of American vine cuttings into South Australian territory. I do not profess to understand his attitude on the question; to me it is incomprehensible. We are luckily free from the phylloxera, and yet he advocates the importation of vines that will in all probability, however carefully fumigated, introduce the pest amongst us, as also several other almost equally disastrous diseases—such as black rot and downy mildew—the possibility of which he completely ignores. It will be time enough to introduce these vines when the pest is amongst us and when it has got quite beyond our control, and this would not be for another twenty or thirty years should it be discovered here to-morrow.

In this connection a passing reference to a leader in a daily contemporary will not prove out of place. In reviewing the report presented by Mr. G. Quinn and myself to the Hon. Minister of Agriculture on the Melbourne Phylloxera Conference, and reproduced in last month's issue of this *Journal*, the writer has poetically compared me to brave Horatius defending the Tiber bridge against the advancing hosts of Porsenna. I am sure I am much indebted for the flattering figure of speech, but trust it will not hold good when examined in its every aspect. The gentleman in question, as his nickname (Cocles) proved, was one-eyed. I trust that I am in full possession of both my visual organs, more especially the weather one; in fact, the insidious conclusion of the article has not escaped my notice, viz., the advocacy of the introduction of American vines into Kangaroo Island. Tacked on to a review of a report for which I was largely responsible such a conclusion would appear to follow naturally from what I had written on the subject. This, however, is very far from being the case, as those who will take the trouble to read the report can readily see for themselves. Such a suicidal policy will never receive my support.

LOCUST DESTRUCTION.

In the daily press attention has been called to the value of the fungus disease for the destruction of locusts, and suggestions made that reports be obtained on the matter, and, if satisfactory, supplies of the fungus be obtained for cultivation in this colony. A few notes on the fungus and also on the arsenical baits for the destruction of the locust may therefore be of interest.

About four years ago it was noted in Natal that the migratory locusts were dying in large numbers, and a fungoid growth upon the dead locusts was noticed by Mr. M. S. Evens, of Durban, Natal, who called attention to it in the local press. The matter was then taken in hand by Mr. A. W. Cooper, F.R.M.S., who, with the co-operation of Dr. S. Black, of the Cape Bacteriological Institute, succeeded in cultivating the fungus, so that ever since prepared tubes containing a special jelly impregnated with the spores of the disease have been distributed to landholders on application, and an immense amount of valuable work has been done. Different methods are adopted to cause the infection of the swarms of locusts. Usually a number of locusts are caught, infected with the fungus, and then distributed amongst the swarms. The locusts as they die are stated to be eaten by the others, causing further spread of the disease; besides which, under suitable conditions, the fungus spreads rapidly otherwise. Mr. Lounsbury, Government Entomologist, Cape Colony, referring to this disease, points out that it is in all probability the same as is known throughout Europe and the American Continent, where it is also reported to effect caterpillars of certain kinds. It is probable that this fungus, which has been known for forty years, is one of the most important natural checks on the undue increase of various species of locusts throughout the world. As he points out, however, *dry weather retards or supends its development*, and visitations of migratory locusts are coincident with or follow long droughts. Excessive moisture favors the extreme propagation of the fungus. This is borne out by the numerous reports received from the Cape and Natal, which show that where there is sufficient moisture in the air or soil the fungus treatment is successful; but in dry spells failure, or at least comparative failure, results. Then, too, the prepared cultures do not keep for any length of time, as the fungus loses its vitality. For these reasons, as well as because we have at hand a remedy reported from Natal to be more efficacious as a general practice, the importation of these cultures has not been recommended. Almost invariably the conditions favorable to the spread of the disease amongst the locusts are absent in this colony when we have any considerable numbers of the pests to deal with.

The other remedy referred to is the laying of poisoned baits, sweetened with sugar, and flavored if necessary with something such as anise oil, jargonel, &c. The president of the Inanda (Natal) Agricultural Association, Mr. Leonard Acutt, in a report to the Natal Agricultural Department, states that the association appointed a locust committee to deal with the various remedies recommended, and they advise that, with the exception of the arsenic treatment, none were more than a partial successs. The arsenic, however, was an absolute and unqualified success, being especially effective against the young hoppers, and also against the flying locusts, but not to the same extent, as the latter appear suddenly and destroy the crops before the poison can be prepared and distributed. Mr. G. Wilkinson, who was the first so use this method, reports that in ten days he cleared his farm (700 acres) of the locusts, at a cost of 7s. per day, and a few shillings for the arsenic, sugar, &c. Many others report similar results; but, as is so frequently the case with such simple remedies, Mr. Acutt reports that for some time it was exceedingly difficult to get the men within a few miles to give any attention to the matter, but now its use has become quite general on the coast. The method of preparing the poison is as follows:—Dissolve 4ozs. washing soda in 1gall. boiling water, then add 8ozs. arsenic, stir well and boil for a few minutes to dissolve, being careful not to inhale the fumes. Put this in a 8gall. galvanized-iron vessel, add 5lbs. to 6lbs. brown sugar, treacle, or honey, then fill up with warm water. Dip into this begass (crushed sugar cane), grass, chopped maize stalks, or any other vegetation that the locusts will eat, allow it to soak well, then squeeze out the moisture and distribute amongst the swarms, or, in case of attack by flying locusts, amongst the crops attacked. As before stated, the mixture may be made more attractive by the addition of flavors, but the smell of sugar will attract the locusts for a hundred yards or more, they eat the poisoned baits, die, and are eaten by other locusts, who in their turn succumb. In three or four days swarms of dead locusts will be found.

POULTRY NOTES.

By D. F. Laurie.

The publication of instructions for making an incubator, which appeared in the previous issue of this journal, has led to numerous inquiries. For the information of general readers I may say that I do not make them nor have I any to sell. Those who are not prepared to construct their own can obtain them from Mr. Gibson, near Miller's Corner, Glenelg. This maker recently showed me some excellent machines of different sizes made exactly in accordance with the designs I have published.

Numerous inquiries have also come to hand *re* brooders or artificial mothers. As a general rule I do not approve of them; many are neither more nor less than death traps. In very cold weather warm shelter is naturally requisite for the welfare of the young birds, but in fine weather they as a rule are better occupied in the healthy exercise of finding part of their living. The application of additional heat to a brooder, either by means of a lamp or by renewing the hot water in a tank, are both methods which are liable to be overdone. Chickens and ducklings are liable to become overheated, and it is not an easy matter to properly ventilate the brooders. At any rate they must be narrow, not wide, and the ventilation must be adjustable, or the results will be most disastrous. If it is attempted to crowd large numbers into large machines the birds will be poisoned with foul air; in any case many will die; those in the middle, either from suffocation or through being trampled upon, those at the sides and ends of cold. I find long narrow boxes about 8in. deep (for very young chicks) to 1ft. deep (for older ones), roughly lined with some soft warm material, and covered with a thick piece of porous flannel hanging loosely and allowing ventilation, quite sufficient for every purpose. In wet weather the chicks must be placed under cover, but on a loose earth floor, or, in an open shed. The chicks will be quite warm enough at night in these small boxes. Before retiring it is a good rule to inspect each box to ascertain if sufficient ventilation is allowed. Chickens when overheated sweat, and if then exposed to the cold air very soon contract pneumonia or inflammation of the lungs. More deaths among chickens and ducklings are thus caused than is generally known. In large establishments, during the cold nights, these boxes may stand on hot water pipes heated to about 80 degrees.

It is a bad plan to encourage the chicks to huddle inside brooders, whether heated or not. They should be induced to roam about the enclosure in search of food. Even when space is limited a small piece of ground, if only a yard square, should be dug up daily for the birds to scratch in. In a state of nature, or at large on an extensive range of suitable country, chickens, &c., will find and consume a surprising quantity of insects, moths, flies, &c., also grit, glass, gravel, bits of bone, mortar, cinders, &c. Many are articles of food; others are aids in the process of digestion It stands to reason that if a chick consumes these things it is with a purpose, and supplies a demand which must be met. The lack of gravel, grit, &c., to assist in the grinding process of digestion causes much loss and disappointment. Lots of chicks and ducklings die from what is often called loose crop (or in other cases hard crop.) Both are caused through disorganised digestion, and although not the sole cause, still the lack of a supply of the before-mentioned articles is a great factor. The correct treatment and feeding of poultry are, without doubt, two of the principal things to learn. Economy—not mean feeding, but as a rule the reverse—cleanliness, and good business habits, all tend to success.

As regards disposing of eggs and table poultry, it may be pointed out that the Victorian Agricultural Department is again sending a fairly large shipment of eggs to England, and as previous consignments have proved successful, there is every reason to hope for continued success. Farmers and others through their own default accept during a great part of the year a very poor price for their eggs. If a few, or their women folk, were to take the matter in hand, and make regular shipments of properly packed infertile eggs, a much more satisfactory cash return would result. Eggs were selling at from 7d. to 10d. per dozen in Melbourne at the time of the shipment, and still experts regard a good profit as almost a certainty. The supply of eggs for the Adelaide market can stand improvement. Really fresh eggs are hardly to be purchased. An egg a week old is hardly entitled to be called fresh.

As regards table poultry, now that the hot weather is approaching the consumption of poultry will increase. It would pay well to establish regular custom in city, suburbs, or even large country towns. Many people very properly will go without poultry rather than pay for worn-out, tough old hens or patriarchial roosters. Poulterers as a rule are an independent tribe, so there must be a highly profitable trade. Even if one could attend the auctions and purchase a pair of decent birds without having to take a dozen mixed it would be better.

Looking at it all round, the poultry industry in all its branches is one that is much neglected, and yet is most suitable for those unable to do hard work, but still able to give the necessary attention to the various details. Our public institutions might do more. An excellent example is already to be found at the Boys' Reformatory, Magill. It is highly desirable to instil practical knowledge of the subject into the rising generation. It seems overlooked at our State schools. Colored lithos. of a few of the principal breeds would be ornamental and instructive if hung in schools, especially in the country. This might refer also to other stock. The great difficulty is to spread information as to breeds and methods, so if the present generation is inaccessible, the rising one might be favorably impressed. There is no need to burden young heads with minute details. A knowledge of the breeds and their crosses, and a few general rules for every day observance, if available, would do a great deal of good.

FARM NOTES FOR NOVEMBER.

By the Editor.

Professor W. Lowrie advocates the cutting of hay of most kinds of cereals when the grain begins to get out of the milky stage. He might probably advocate somewhat earlier cutting of a few varieties which may develop bitterness or other objectionable qualities later on. In Europe and America it is almost universal to recommend cutting of all crops for hay just when the flowering is finished.

Because some optimists have claimed too much for silage this valuable fodder has fallen into disfavor with many farmers. Four tons of meadow grass will make only 1 ton of dry hay, but 4 tons of green grass will make 3½ tons of silage. The ton of dry hay may feed a cow for five or perhaps six weeks, and her milk will lessen considerably, whilst the butter will be white and wanting in flavor. Three and a half tons of succulent silage will feed a cow for sixteen weeks, her milk will remain constant, and the butter will be rich and well flavored. Whether feeding hay or silage it is always advisable to give the cows some bran, corn, and similar food. For dry stock hay may suffice, but the animals undoubtedly will have a sleeker appearance and more healthy look if they can have a daily ration of silage. The greater the variety of nourishing plants put into the pit or stack the better will be the silage. For cows, slightly sour pit silage is undoubtedly the best, but many authorities prefer sweet silage for dry stock.

Wheat that is harvested when the dough begins to harden is brighter, heavier, contains more flour and gluten, and less bran than that which is left to become dead ripe. The straw is worth a great deal more as food for stock. Straw left on the field for a few weeks loses gum, starch, oil, sugar, and aroma, and little is left but vegetable fibre. Several analyses of straw cut when the grain was in the dough stage (the grain of course being thrashed out and removed) gave a nutritive value within 15 per cent. of the best wheaten hay.

When crops are cut with the binder, the grain can be harvested earlier, in damp weather. The grain is better, the straw is more valuable as fodder; the greater part of the oats and weeds is gathered in; the land can be harrowed or scarified early to let in all rain; and weeds get a chance to start early to serve as early feed, and can be ploughed under later on.

There is reason to hope that rains may fall during the next three months, and it takes but little moisture to bring forward some plants sufficiently to afford a little succulent feed for the farm stock. Large areas, of course, cannot be treated, but a few acres of stubble land could be worked down to a fine tilth with the aid of heavy harrows or a cultivator, and sown with about 4lbs. each of white mustard and dwarf Essex rape. If sown in drills it will be all the better; and the results will be even more satisfactory if the crop can be afterwards cultivated a few times. It is not worth while, however, to attempt to grow these crops on heavy clay soils during autumn.

Cabbage, rape, "geranium," clover, lucern, turnip tops, mangold, or beet leaves and other succulent fodder can be ensiled with alternate layers of straw, each layer about 1ft. deep.

When live stock are to be turned on to sorghum, or any other green crop, be most careful that they are not hungry, else they will gorge themselves and become bloated and die. If they are turned on after a good feed of dry stuff, they will not hurt themselves. When feeding mangold or beet leaves do not give too many at first, as the animals will scour until they get used to the food.

When peas or beans are to be carted in, do the work early in the morning, or during cool, damp weather. Pea straw is good for cows, as well as other stock.

Barley for malting may be harvested with the stripper by placing bacon rind under the spindles of the beaters, and sewing raw hide round the beaters.

Perhaps an appeal to the pocket may prove effective where humanitarian views have no effect. Live stock exposed to all the vicissitudes of cold and heat lose health and condition, consequently are of much less value than those animals that are properly sheltered. It is neither costly nor difficult to erect a shed of sticks and straw; except, perhaps, where wood has to be carted long distances. In such cases it will be well worth while to co-operate and procure a continuous straw and hay baling press, and use baled straw for building the walls of stock shelters, machinery and other sheds.

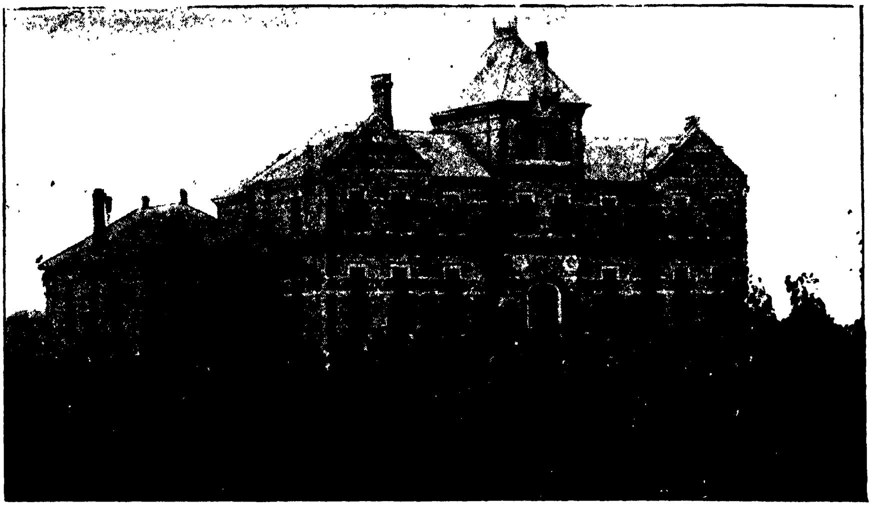
The sooner hay and straw stacks are thatched or covered the better. Do not place all the stacks close together or too near the road, in case of fire. Insure if possible.

When the crops are beginning to ripen, go through the fields and select any specially early or prolific ears for special cultivation later on. After a few years of such selection and re-selection, a valuable variety will be the result.

Directly any implement is done with for the season, get it put into perfect repair, clean, oil, and paint it where necessary, and place under shelter where the fowls cannot roost on it.

THE SPALDING-ROBBIN'S DISC PLOUGH.

With such a dry winter as has been experienced in this colony, [illegible] has been retarded and the ground has become very hard, making cultivation a matter of great difficulty. The land, however, cannot be allowed to remain idle, hence our farmers must look for the best implement to meet the circumstances with which they are faced. Last summer the Spalding-Robbin's rotary disc plough was tried in various parts of South Australia, in all sorts of hard dry soils, and its success was beyond all doubt. Mr. Sampson, of Salisbury, one of the Royal Agricultural Society's judges, says that he tried the disc plough on extremely sticky soil in June last, and was surprised at the splendid work it did, and the new scrapers cleaned it as it worked, so that the labor and waste of time by having to stop and scrape off the clogged earth was entirely obviated. That is an excellent testimony as to its worth on sticky ground, but many of our farmers will this year have to do their ploughing in hard dry ground, and for that class of work the disc plough will be found very effective. In this issue will be found an illustration of the plough [illegible] college farm, at Roseworthy.



SPALDING-ROBBINS ROTARY DISC PLOUGH AT THE COLLEGE FARM.

STOCK NOTES.

By C. J. Valentine, Chief Inspector of Stock.

The inspector's reports for the quarter show a large number of stock inspected, and a number of diseased stock have been found and destroyed. Local complaints have not been so prevalent, but still a good many deaths have occurred. Diseases of the digestive organs, impaction of the omasum, cripples, rickets, asthenic apoplexy, a few cases of fluke, inflamed and indurated udders in milch cows, and a few deaths of calves from diarrhœa from improper feeding with skim milk; a well marked case of malignant œdema in sheep occurred, and these sheep were found affected with tuberculosis, the bacilli being found from nodules taken from the flank.

Only two deaths from pleuro-pneumonia were reported. Cattle which were inoculated have shown no further signs of disease, and a number of working bullocks were inoculated as a precautionary measure. Droves of store cattle have been sold, and although owners are desirous of inoculating them, virus has not been obtainable.

A large number of dairy cattle have been examined both in the Lower North and South-East, and some very bad cases of tuberculosis have been found. Many interesting *post-mortem* examinations have been made, and the serious nature of the disease has been impressed upon owners. Opportunity was taken to get a number of farmers to see a *post mortem* on an animal with a comparatively healthy appearance, and they appeared to be much impressed by the extremely serious condition of the internal state of the animal. It is satisfactory to note that in several cases the origin of the outbreaks have been traced to certain centres, from which it had gradually spread. A good proportion of the cattle destroyed were milch cows, and in a few cases tubercle bacilli were found in the milk. In four cases the disease was confined to the udder, no trace being present in the internal organs. One small herd was tested with tuberculin, and found to be healthy. Two calves, 6 and 10 months old, which had been suckled by diseased mothers, were found diseased on being killed. In the North, most of the cattle destroyed—about seventy—were taken from droves of fat and store cattle, only a few being milking cattle. Out of 157 destroyed, sixty-three were milch cows, twenty-two were killed badly affected with actinomycosis, and nineteen suffering from cancer. Sixty *post-mortem* examinations were made, and a number of specimens were examined microscopically, verifying the diagnosis of the officers. Thirty diseased animals were stopped by the inspector at Birdsville from being introduced into the province. All the cattle passed were free from cattle tick.

The lambing is reported as very good, and the wool in excellent condition and weighty.

Two hundred and sixty-two thousand seven hundred and forty-eight sheep, 33,113 cattle, 3,000 horses, and 587 camels were examined by the inspectors.

Diseases in Great Britain.

In the month of August eight fresh outbreaks of scab occurred in six counties, and scab existed in thirty counties. The number of sheep affected and liable to infection is not mentioned.

For the thirty-six weeks in 1899 there were 370 outbreaks of anthrax, and 743 animals attacked. Glanders (including farcy) returns show 535 outbreaks, and 975 animals attacked; rabies, three cases; swine fever, 1,861 outbreaks, and 23,927 swine slaughtered as diseased or exposed to infection. The progress made in stamping out swine fever is anything but satisfactory, and if the suspected outbreak in Queensland is not managed in a more satisfactory manner it will only be the work of time to have the disease spread over Australia.

MONTHLY RAINFALL.

The following table shows the rainfall for October:—

Adelaide	1·23
Wilson	0·30
Quorn	0·42
Port Germein	0·31
Port Pirie	0·29
Crystal Brook	0·32
Port Broughton	0·43
Hammond	0·35
Bruce	0·26
Melrose	0·32
Wirrabara	0·27
Appila	0·25
Laura	0·35
Caltowie	0·26
Jamestown	0·32
Gladstone	0·29
Georgetown	0·39
Narridy	0·39
Redhill	0·46
Koolunga	0·37
Carrieton	0·32
Eurelia	0·33
Black Rock	0·58
Petersburg	0·58
Yongala	0·47
Terowie	0·74
Yarcowie	0·40
Hallett	0·43
Burra	0·63
Snowtown	0·68
Brinkworth	0·60
Blyth	0·49
Clare	0·59
Mintaro Central	0·60
Watervale	1·05
Auburn	0·79
Manoora	0·65
Hoyleton	0·70
Balaklava	0·80
Port Wakefield	0 51
Saddleworth	0·71
Marrabel	0·77
Riverton	0·71
Tarlee	0·93
Stockport	0·79
Hamley Bridge	0·79
Kapunda	0·82
Freeling	0·80
Stockwell	0·99
Nuriootpa	0·78
Angaston	0·75
Tanunda	1·24
Lyndoch	0·89
Mallala	0·93
Roseworthy	0·52
Gawler	0·94
Smithfield	0·79
Two Wells	0 72
Virginia	1·13
Salisbury	0·93
Teatree Gully	1·80
Magill	1·33
Crafers	2·25
Clarendon	1·93
Morphett Vale	1·20
Noarlunga	0·78
Willunga	1·23
Aldinga	0·78
Normanville	0·85
Yankalilla	1·05
Eudunda	0·66
Truro	0·51
Mount Pleasant	1·40
Blumberg	1·31
Gumeracha	1·77
Lobethal	1·78
Woodside	1·68
Hahndorf	2·78
Nairne	1·47
Mount Barker	1·75
Echunga	1·80
Macclesfield	1·70
Meadows	2·08
Strathalbyn	0·80
Callington	0·69
Langhorne's Bridge	0·86
Milang	0·74
Wallaroo	0·45
Kadina	0·43
Moonta	0·56
Green's Plains	0·93
Maitland	0·95
Ardrossan	0·39
Port Victoria	0·28
Curramulka	0·48
Minlaton	0·37
Stansbury	1·06
Warooka	0·50
Yorketown	0·47
Edithburgh	0·54
Fowler's Bay	0·26
Streaky Bay	0·39
Port Elliston	0·63
Port Lincoln	0·81
Cowell	1·10
Queenscliffe	0·88
Port Elliot	1·39
Goolwa	0·75
Meningie	0·96
Kingston	1·73
Robe	1·96
Beachport	2·38
Bordertown	1·54
Wolseley	1·21
Frances	2·10
Naracoorte	1·48
Lucindale	1·48
Penola	1·85
Millicent	2·37
Mount Gambier	2·82
Wellington	0·87
Murray Bridge	0·79
Mannum	0·55
Morgan	0·39
Overland Corner	0·81
Renmark	0·75

WEATHER AND CROP REPORTS.

Appila-Yarrowie.—The crops look well, but upon examination many dummy heads are found. Some of the early wheat was quite spoilt by the frost, and instead of giving 15bush. to 16bush. per acre would only give 2bush. or 3bush. The apricots have also suffered severely.

Arden Vale.—The weather has been pleasantly cool for this season of the year, but rain would benefit the late crops. The harvest prospects are fair. Some of the best wheat came up with the March rains. Haymaking is general; feed is especially abundant.

Balaklava.—October has not proved so favorable to the crops as the previous month, only light rains having been recorded. Hay crops will be light, and unless a good fall occurs soon the wheat yields will be a lot below last year. Hot winds and frosts have done considerable damage to vines, potatoes, and stone fruits. Fruit crops generally will be light.

Bowhill.—Haymaking is being pushed forward, and yields will average from 15cwts. to 20cwts. Frosts have done considerable damage to the early crops, some of which will be cut for hay. The early crops that escaped the frost will yield better than last year. Red rust is also prevalent, but has not yet materially affected the plant. Grass is plentiful and stock are in excellent condition.

Burra.—Crops continue to look well in some localities, but recent frosts have caused considerable damage, especially to vines and fig trees.

Elbow Hill.—Rough hot winds about the middle of the month did a good deal of damage, but with the favorable conditions since experienced the crops not really blighted are filling out well. Grass plentiful and stock in good condition. Rainfall for month 0·76in.

Gawler River.—The crops feel the effects of the continued dry weather, and though the early wheat is good and filling out fairly well, some of the late crops will be very poor. Haycutting is general, but the yield is only fair. Stock in good condition, but feed is drying up fast, and will soon be scarce. Rainfall for October 0·79in. The late frosts have not done much harm here. Some fruits—peaches, plums, and pears—have not set well this year.

Port Elliot.—Owing to favorable weather experienced during the past six weeks, feed is plentiful and stock in good condition. The local show proved the capabilities of the district for the production of fruit and vegetables to be first class. Present appearances indicate a fair average crop of fruits. Haymaking will be later than usual this year.

Kapunda.—September recorded 2·56in., but October rains have been too light to keep the crops growing, while the hot winds have blighted portions. Haymaking has commenced; the cut generally will be light. Stock looking fairly well, but feed not so plentiful as usual.

Lucindale.—Nice rains have fallen during the month and have brought on the crops and and feed. The caterpillar plague has moved along and with a little rain soon there will be a little feed on the ground affected by the pest. Shearing has started, and will soon be general. a good clip is almost certain.

Lyrup.—Frosts have severely injured some of the early potato crops. On the 14th 0·60in. of rain fell. Crops all round now look fairly well.

Millicent.—The weather during the past month has been all that could be desired. Grass is luxuriant and plentiful; crops are healthy and coming on fast. Heavy frosts early in August killed a lot of the early potatoes. Rainfall for the three weeks, 1·98in.

Mount Compass.—Weather still very unsettled. Rainfall, 1·72in.: for ten months, 27·98in. There is more grass than we have had for several years at this season. Stock of all kinds looking well.

Mount Remarkable.—As a whole the crops are very promising, but those sown late require rain. Frosts have nipped the crops on low-lying land, but not to any serious extent. The gardens have suffered severely from frost, apricots, peaches, and apples being in many cases a complete failure; potatoes and sorghum crops have also suffered. The weather has been characterised by extreme changes. Snow fell on September 30 in considerable quantity on the range, and three or four sharps have been experienced. Rain has been light, and usually preceded by dry, hot, northerly winds.

Mundoora.—The crops are suffering very much from want of grain, the north winds spoiling them in all directions.

Nantawarra.—Stock of all kinds in good condition. Shearing is over, and most farmers are well satisfied with their returns. Haymaking is now in full swing, but most of the yields will be very light. Rainfall for year to date, 8·59in.

Riverton.—Harvesting of early crops has commenced. Light crops are expected, owing to the small rainfall this year.

Swan Reach.—Weather continues favorable, and stock is in good condition. Rabbits are very numerous. Haymaking is general; in some places it is already completed.

Watervale.—Frosts have done considerable damage, especially to vines and fruit trees. Rain is badly wanted.

Wilson.—The weather during October has been very disappointing. It has been changing constantly, with a great deal of wind, but very little rain. The spirit of cheerfulness induced by the nice rain early in September has given place to one of despondency. Crops are drying off very rapidly under the influence of the heat, and the average yield must be very light. A few good crops are found on the more sandy soils.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— November 1, 1899.

The late month was not so favorable as its predecessor; cool weather prevailed, but too frosty and dry, especially in most of the northern districts, where haymaking is now general and reaping has already commenced, the first load of new season's having been delivered at Port Germein a week ago. A smaller area than usual is likely to be cut for hay, owing to the improved state of the wheat market, and although rain would be of no use in the early parts, a moderate fall would still do a lot of good in the later districts, where, up to the present, crops are looking very well. Growing feed is plentiful, though of course there are always some places where the growth is meagre, and in two or three directions in the North some anxiety is being caused by the appearance of locusts, experience of which in the past has given our farmers cause for fear. Pastoral prospects are still looking up, gauged by the wool sales lately held, giving very satisfactory returns. A continuance of this should undoubtedly soon lead to the reoccupation of some of the abandoned runs, which are being offered on such reasonable terms.

Business is fairly active in most wholesale lines, and, if one may judge by the absence of grumbling amongst retailers, trade is at least fair with them, both in town and country. A lot of work is being put into the development of mining, especially for copper, and apparently with encouraging results, so that the year is likely to see a large increase in the exportation of ores and metal.

A somewhat exciting month has been experienced in breadstuffs. The Transvaal trouble brought along heavy orders for wheat and flour as well as forage lines to Australasia, Melbourne securing a large share of the business, but causing prices, however, to harden here; and when it became known that Calcutta buyers were also operating, values advanced throughout the colonies about 4d. per bushel, some fair-sized parcels changing hands here at up to 3s 3¼d. per bushel. The English market has also ruled firm, but business on the level of Port Adelaide rates would not permit of exportation to Europe, though helping towards the hardening of price here. During the past week, however, values have been knocked back about 3d., owing to America being able to undersell us, both for Cape and Indian orders, so that the previous advance has been nearly lost, although the outlook of the market is decidedly favorable for holders. Flour has moved in sympathy with the price of wheat, but local demand is light; only a small intercolonial export trade doing, to the extent of contracts made earlier in the season. All forage lines have improved, the demand from South Africa having caused West Australian orders to be executed here. Chaff has advanced about 5s., in expectation of lighter cuttings of hay. Quotations for feeding grains are slightly higher.

New local potatoes, as usual, began to take the place of old season's during October, but the early crops turning out miserably poor, as the result of heavy frosts experienced has caused values to rule high, extreme rates being offered at moment, although imported old, in very fair condition for so late in the season, are obtainable at lower prices, thus establishing a very wide margin in this line. New onions are also gradually taking the place of old season's stock, which is now about exhausted, the dry season showing its effect by the prevailing high rates ruling also for these.

In dairy products the volume of trade during the past month was heavy, although some lines did not reach average. Butter figured well, both local and export demand continuing brisk at improving rates, notwithstanding European values giving way about 1½d. per pound, buyers for export to British markets not having raised their purchasing prices up to the extreme rates obtaining four or five weeks ago in the Northern Hemisphere, and thus anticipated the fall which was looked for when the first Australian new season's came on the London market. Values here during the month improved about 1d., prints and bulk; but, in sympathy with cable advices from London, a weakening tendency is now showing. Owing to the cool weather rather a light trade has been doing in cheese; price, however, about sustains, as some factories have reduced their output by taking advantage of the good demand for butter. Bacon showed a slight easing, which brought along export orders from Western Australia, and in consequence this line is again displaying a tendency to firmness. Honey has been very dull, and but little business probable until new season's take begins to reach the market. Beeswax had brisk sale. Eggs, as expected, advanced steadily in price, but have again eased back slightly, though now firm at 1d. above lowest September rates, and with the approach of Christmas will, no doubt, move in an upward direction. Almonds still continue scarce and dear.

Increasingly heavy quantities of poultry have been catalogued during the month. The market, especially towards latter part, eased down somewhat, but no collapse is anticipated, as a little further drop in price would probably bring in buyers for the West. Turkeys improved during the month, and were selling fairly well for a couple of weeks, but this line also eased back again at our last sales. Taken altogether, however, for time of year, poultry is realising good rates for consigners.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Farmers' lots at Port Adelaide, 3s. to 3s. 1d.; outports, to 3s. per bushel of 60lbs.

Flour.—City brands, £7 5s. to £7 10s.; country, £6 17s. 6d. to £7 2s. 6d. per ton of 2,000lbs.

Bran, 9d. to 9½d.; pollard, 9d. per bushel of 20lbs.

Oats.—Local Algerian, 2s.; good stout white, 2s. 8d. to 2s. 10d. per bushel of 40lbs.

Barley.—Malting, nominal; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 7s. 6d. to £3 12s. 6d. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Local, new, £7 to £8; Imported, £3 to £3 10s. per 2,240lbs.

Onions.—£5 10s. to £6 per 2,240lbs.

Butter.—Creamery and factory prints, 9¾d. to 10¼d.; bulk, 9½d. to 10d.; dairy and collectors' lines, 6½d. to 9d. per pound.

Cheese.—S.A. factory, best, 6d. to 6¾d.; ordinary to fair 4¾d. to 5½d. per pound.

Bacon.—Factory-cured sides, 6d. to 6½d.; farm lots, 5½d. to 6d. per pound.
Hams.—S.A. factory, scarce, 7½d. to 9½d. per pound.
Eggs —Loose, 6d.; in casks, f.o.b., 7½d. per dozen.
Lard.—In bladders, 5d.; tins, 4d. per pound.
Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.
Almonds.—Soft shells, 5d. to 5½d.; kernels, 1s. 2d. per pound.
Gum.—Best clear wattle, 2d. per pound.

Good table roosters sold from 1s. 5d. to 1s. 7d.; cockerels and hens, 1s. 3d. to 1s. 4d.; small birds, from 11d. to 1s. 2d.; ducks, from 1s. 7d. to 1s. 9d.; ducklings, 1s. 4d.; geese, 3s. to 3s. 6d.; pigeons, 6½d.; turkeys, from 3½d. for fattening to 5¾d. per pound live weight for good table birds.

CENTRAL AGRICULTURAL BUREAU.

Wednesday, October 18, 1899.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, K.C.M.G., Hon. A. W. Sandford, M.L.C., Messrs. W. C. Grasby, Thos. Hardy, R. Homburg, M.P., T. B. Robson, W. F. Snow, C. J. Valentine, and A. Molineux (Secretary).

Finances.

The Secretary reported that £300 had been placed on the Estimates for Bureau expenses. This amount was to cover cost of stationery, postages, travelling expenses, and other items connected with the Bureau. The amount was £20 less than was expended last year for the same purpose, and it meant that the members of the Central Bureau would not be able to accept the invitations to visit the various Branches to the extent they should; otherwise the amount would be exhausted before the end of the financial year.

Mr. Hardy said it most important that the Central Bureau should be represented at the various conferences and field trials arranged by the Branches, and at least one member should attend at each of these meetings.

Other members agreed.

Mineral Fertilisers.

The Chairman said some two years back the Bureau asked that a report should be obtained from the Government Geologist as to the possibilities of deposits of potash salts being found beneath or adjacent to the gypsum deposits and salt lakes on Yorke's Peninsula. The Geologist had asked for information as to the strata in which the Stassfurt deposits existed, and the Chairman had obtained from Germany the desired information, together with a descriptive map.

Mr. Snow said he had had several interviews with Mr. Brown about this matter. As far as he could ascertain the formation of the country in the southern portion of the peninsula was almost identical with that at Stassfurt, and he thought it would not cost much to put down a few bores to ascertain whether there was any deposit of rock salt beneath the gypsum. The discovery of such deposits would be of immense value to the colony, and warranted the expenditure required to test the locality.

Phylloxera Bill.

Mr. Hardy wished to call attention to the delay of the Phylloxera Bill. It almost looked as though the matter would be allowed to lapse again. This would be a great mistake, and he thought the Bureau should urge on the Government the necessity for pressing on with the Bill. Other members agreed with Mr. Hardy, but Mr. Homburg thought there was no need for the Bureau to move again, as there was little doubt but that the Bill would go through all right this session.

Extracts and Translations.

The Chairman tabled the following extracts and translations from Foreign Agronomical Papers:—

315. *Withered Lemon and Orange Trees.*—Last year many such trees offered for sale were (in consequence of the dry winds of September) in a very bad state for planting, and the remedy, of placing them in a ditch intermixed with fine soil and then watered, would have been hardly sufficient. In such a case it may be advisable, after pruning back, to wind moss around the remaining twigs and stem and keep these pretty wet until the weather improves.

316. *Bleaching Celery.*—The *Revue Horticole* says: Tie the leaves tight together and roll strong packing-paper several times around them, and thus save the trouble of growing the celery in ditches and earthing up. At Buffalo they also heap leaves around the plants to prevent frost.

317. *Asparagus.*—Mr. Geo. Norman, F.R.H.S., read a paper in April, 1899, before the Royal Horticultural Society, and says, with Pliny—"Of all garden plants, it is the one that requires the most delicate attention in its cultivation." Naturally it grows best on the sea coasts in the sands where at times the sea breaks over, deluging the soil. Rotten seaweed there gives the necessary nitrogen, shells the lime, and potash is always abundant near the sea. How to cultivate asparagus elsewhere cheap enough and yet at a profit, and of such size as to satisfy the consumers, is well worthy of consideration. Where a rich sandy soil of good depth can be found the cultivation is an easy matter. With labor and materials at hand, heavy clay soil may be in time brought into a light, porous condition by the addition of sand from any source, or burned earth, or lime, brick and rubble from old buildings. Leaf mould, peat, light fibrous loam, old hot-bed material, seaweed, and dung (especially from cows) are required as fertilisers. The soil can hardly be too highly manured, as good quality depends on quickness of growth. Asparagus is a deep-rooting plant—up to 30in.—and the soil should be well mixed with all the materials at hand to make it porous. Sow the seed thinly, in drills 1in. deep and the drills 1ft. apart, at the rate of ½oz. to 15yds. run of drill. June and July are the best months for sowing, and transplanting into the trenched ground should take place about twelve months later, when the shoots are grown to a length of at least 3in. or 4in. The vegetative powers must have become active before transplanting. Plant in rows in a trench 6in. deep, leaving the crown of each plant about 2in. beneath the surface; and, after covering, give one or several good waterings. Make the beds 5ft. wide, with three rows; the plants in the rows to be 2½ft. apart. The French allow 4ft. from row to row and 3ft. in the row. The crowns come gradually nearer the surface, especially where the heads are cut while only just showing above the surface, as the French and Germans do. Every winter place some inches of old manure or compost on the bed; where the soil is not of a light nature some lime is also desirable. The plants should bring forth very strong shoots before beginning to cut—probably not before the third year. Do not cut weak shoots, and allow all shoots to grow after two months of cutting.

318. *Importation of Raw Fruit into England.*—H.M. Customs considered the bushel (as the unit of quantity) as indefinite and unsatisfactory. The Royal Horticultural Society thereupon considered the question, and decided that the quotation by measure is altogether misleading, and are of opinion that all importations of fruit should be recorded by weight. The best weight to use is the ton of 2,240lbs.

319. *Pearson's Ironclad Vine* is probably a hybrid between V. labrusca and V. aestivalis, and is said to resist phylloxera better than any other grape known. Cuttings have been lately sent to France from the only wild vine growing in the neighborhood of Darby, near Philadelphia, since the time of William Penn, where it covers a huge forest tree, has a trunk almost 12in. in diameter, and yields about 2 tons of nice-flavored fruit of a rich purple. The juice is so dark that it is used as ink, and letters that were written twenty years ago look as if written yesterday. All Mr. Pearson's other vines were ruined by phylloxera, but his Ironclads—although preferred by phylloxera to any other vine—were not hurt, being so vigorous that they make new roots as fast as the old ones become infested. The fungus Phoma uvicola does not attack it.

320. *Forestry in Germany.*—According to Gustav Wagener, Counsellor of Forests, at Coburg, there are thirty-five millions of acres of forests in Germany, of which eleven and one-quarter millions acres are owned by the State. Henceforth forests will be planted only for timber, not for firewood. Timber will pay better and better, while the price of firewood sinks more and more in consequence of the low price of coals, which can be transported now cheaply by means of local railways and by water. There is a very large export of timber from Germany to the western countries of Europe that are almost without forests. In advocating a term of eighty years for the cutting of pine forests he calculates from medium soil a yearly revenue of from 3 per cent. to 5 per cent. on the value of the soil. With beech forests it will be about the same, but oaks will require from 120 to 160 years before they should be felled, and the value of their timber is constantly rising.

Tuberculosis.

Mr. C. J. Valentine (Chief Inspector of Stock and Brands) said that a special case of some interest occurred in the South-East District, where Mr. Inspector Williams carried out a successful testing case for tuberculosis. In a small herd seven cows were found to react, and five were killed and found diseased. The others were isolated and will be examined when killed. The origin of this outbreak was traced to a bull used some few years before, which was killed for tuberculosis. This herd will, now that the disease is known to have been amongst them, be under supervision, and the owner, who is most careful, will soon stamp out the disease.

New Branches.

Applications for permission to form Branches at Two Wells and Ramco could not be approved, owing to proximity to already existing Branches.

An application for permission to form a Branch at Scales Bay in place of the Branch at Calca, recently closed, was approved, the following gentlemen being appointed members:—Messrs. J. E. Freeman, F. W. Freeman, A. Newbold, G. Newbold, J. J. Roberts, J. E. Dinsdale, Chas. Nugent, W. J. Thomas, R. S. Thomas, E. R. Aitchison, and D. P. Thomas.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Onetree Hill, Mr. A. H. Riggs; Gawler River, Messrs. Chas. Leak and J. Drinkwater; Robertstown, Messrs. H. Farley, and C. H. Kotz; Yorketown, Messrs. C. H. Davey and H. Hughes; Mylor, Messrs. Jas. Nicholl and R. Russell; Woolundunga, Mr. S. Levick; Brinkworth, Messrs. W. H. Shepherd, J. Wilke, and G. Woolridge; Renmark, Mr. Thos. Rogers; Maitland, Mr. W. H. P. Jury; Meningie, Mr. S. F. Robinson; Murray Bridge, Mr. W. G. Hannaford; Orroroo, Mr. T. Scriven; Wilmington, Messrs. R. G. S. Payne, J. Hannagan, and A. Paull; Arthurton, Mr. Thos. Baldock; Mannum, Messrs. R. P. Scott, J. L. Scott, and H. Wilhelm; Burra, Mr. J. A. Arnold; Renmark, Mr. S. R. Cox; Swan Reach, Mr. O. Halliger; Murray Bridge, Mr. A. G. Kutzer; Narridy, Mr. Jno. Smart; Meadows, Mr. F. W. Vickery; Lyrup, Mr. G. A. Bollenhagen; Caltowie, Mr. A. Becker; Finniss, Mr. E. Cameron; Forster, Messrs. W. Sears and — Childs.

Reports by Branches.

The Secretary reported receipt, during past two months, of 136 reports of Branch meetings.

REPORTS BY BRANCHES.

Tatiara, September 30.

Present—Messrs. Thos. Stanton (Chairman), R. Scown, E. Prescott, F. Smith, H. Killmier, Jos. Green, G. Milne, R. Penny, and C. H. W. Wiese.

Attendance.—Some discussion ensued on the question of non-attendance of certain of the members. Several members expressed the opinion that the rule that members absent without excuse for four consecutive meetings should be struck off the roll should be enforced. It was decided to consider the matter at next meeting.

Agricultural Shows.—Mr. Prescott directed attention to paper on this subject read by Mr. Bates at Naracoorte Branch and published in the September issue of the *Journal of Agriculture*, and wished the Branch to discuss the question at next meeting. He said the sum of £1,500 was voted annually by Parliament for the Agricultural Societies, but the district did not in his opinion get a fair proportion of the amount. Mr. Killmier pointed out that the subsidy was allotted *pro rata* on the prize money paid by the various societies.

WHEAT APHIS.—Mr. Milne tabled wheat affected by insects like the cabbage aphis. [This is a species of aphis, and is not infrequently found on the wheat at certain seasons. Generally, however, it is not in sufficient numbers to do much harm. There is no practicable remedy when they attack the wheat on a large scale.—GEN. SEC.]

Boothby, September 25.

Present—Messrs. H. G. Evans (Chairman), J. R. Way, A. Robb, T. Robinson, H. S. Robinson, R. Carn, J. Bell, M. Leonard, T. Sims, G. T. Way, R. M. B. Whyte (Hon. Sec.), and one visitor.

BORING FOR WATER.—Mr. G. T. Way read a short paper on this subject as follows:—

In many places an abundant supply of water is obtainable from underground in localities where the present supply is very limited, and in many cases of bad quality. As a rule, the farmer makes dams, tanks, &c., and finds his supply far from permanent. He will consequently enlarge the holding capacity of his tanks and dams to such an extent that if they get filled they will hold ample for all requirements. Still he is dependent upon the rain, and it often happens that a season that may return good crops will be of such a character that very little water is caught, the consequence being that when the summer sets in the supply of water is only sufficient for a few weeks. This is the great advantage of a good underground supply of water to the farmer. Then how is this supply to be obtained? By the use of boring apparatus in preference to sinking wells at considerable cost on the off chance of obtaining water. With boring rods the ground may be tested to a considerable depth at very little cost and without much loss of time. The farmer could sink to a fair depth quite a number of test holes in the course of a week with a good set of light rods—⅞in. gas piping will do. Get an old 2in. augur, cut off about 15in., and screw it into the first rod, of about 10ft. in lenth. Screw the other end of the augur into a 5ft. length for a handle. When sinking 60ft. or more it is advisable to first sink about 8ft. deep, lay a good piece of timber across the hole, bored in the centre sufficiently to allow the rods to pass through. Plumb your rod before starting. If the ground is good for boring 20ft. can be bored in a few hours.

Considerable discussion ensued, the members being of opinion that boring was the cheapest and best in the long run.

STOCK COMPLAINTS.—Mr. Leonard said one of his horses cut its foot under the fetlock close to the hoof with barb wire and almost bled to death before it was found. The wound had nearly healed, but the horse had gone blind. Mr. Sims had lost cattle from some unknown complaint. Fat stock died more quickly than those in poor condition. It was decided to ask that one of the stock inspectors be allowed to visit the district, as many people were complaining of disease in their stock.

Mount Bryan East, September 23.

Present—Messrs. T. Wilks (Chairman), A. Pohlner, W. Bryce, E. Prior, J. Prior, W. Dare (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. J. Prior tabled wire-netting rabbit-trap, same as illustrated in the *Journal of Agriculture* for December, 1898, page 409. Mr. E. Prior tabled sample of Red Straw wheat, 2ft. 3in. high. Members reported reasonable hope for a good wheat crop.

Caltowie, September 22.

Present—Messrs. J. G. Lehmann (Chairman), J. Neate, J. Potter, J. Noonan, A. McCallum, G. Petatz, A. Kerr, L. Graham, and A. McDonald (Hon. Sec.).

Dairying.—A Committee was appointed to take charge of the Ayrshire bull loaned to the Branch by the Department of Agriculture.

Sheep.—Mr. A. Kerr read a paper on "Does it Pay Farmers to Buy or Breed Sheep ?"—

This was a very important question for the small farmer who crops most of his land. Every farmer with a fair area of land should keep sheep, as they clean the land and provide meat for the household, besides returning a direct profit. The point is, is it better to buy sheep to fatten, or breed them ? He considered it would pay better to buy. The seasons are so uncertain that some years you can keep a sheep to the acre, in others you are far better off without any sheep. No farmer should buy sheep unless he has enough feed in his paddocks or prospects of good feed to fatten all he buys. Take the present season. He noticed that farmers were buying sheep at a price leaving very little margin for profit even with a fair season for feed. As a rule, it is unsafe to buy before July or August, as then you will nearly always know about what number you can fatten, the quantity of wool you will get, besides having a fair idea of the price of wool. After shearing is often a good time to buy. He had always done best with sheep bought about February, nearly fat. They will fetch double the price in three months' time under average conditions if you have good feed available. When buying, the farmer should try to get only good sheep, as the skins form a valuable item in the returns, besides having better fat sheep to sell. He would give his opinion of the profits of breeding *versus* buying sheep for small farms, confining himself to the merino as being most suitable for this district. The lambs would be fat at four to five months, and it will give very little time to fatten the ewes within the twelve months of commencing breeding. Allow 80 per cent. of lambs from 100 ewes. These at 7s. will be worth £28 ; profit on 100 ewes at, say, 3s. per head, £15 – total, £43. The price paid need not be considered, as you will pay as much for ewes for breeding as sheep for fattening. The returns from the wool also will be practically the same. From the returns must be deducted the hire of two good rams, £1 10s., leaving net profit from breeding of £41 10s. On the other hand, you can fatten three lots of sheep in twelve months in a fair season much safer than keeping 100 ewes and their lambs. At a profit of 3s. per head 300 sheep will bring in £45. Another point in favor of keeping dry sheep is that if feed runs short you can dispose of them as fat sheep if in anything like good condition, and buy no more until you have the feed, thus avoiding any further loss. With ewes and lambs, however, it is impossible to sell without loss unless they are in good condition. Under such circumstances it may be necessary to kill the lambs to save the ewes, which will result in much loss to the farmer.

Considerable discussion ensued, most of the members agreeing that during the past few years it had paid better to purchase and fatten sheep for sale rather than to breed them.

Forster, September 28.

Present—Messrs. A. Johns (Chairman), F. Towell, J. Sears, J. Rettalack, J. Johns, F. Johns, A. G. Prosser, J. D. Prosser (Hon. Sec.), and six visitors.

Sheep Weed.—An interesting discussion took place on the spread of this weed The Chairman thought the only way to get rid of it was to pull it up before it flowers. Other members thought burning would destroy it.

Season.—Members reported that since the last rains the wheat crops have recovered, and are growing very rapidly. There is now promise of a good harvest.

Dowlingville, September 22.

Present—Messrs. R. A. Montgomery (Chairman), J. Phelps, R. Foggo, G. Mason, F. W. Roberts (Hon. Sec.), and two visitors.

Bluestone Test.—Some discussion took place on tests for adulteration of bluestone, but owing to small attendance all business was postponed.

Dawson, September 9.

Present—Messrs. R. Renton (Chairman), C. H. Meyers, F. Schibella, and A. F. Dempsey (Hon. Sec.).

CONGRESS.—Matters in connection with Congress were discussed, and it was resolved that the delegates advocate that the price of wheat should be higher or lower than the ordinary price according as the sample was above or below the standard for the season.

MANURES.—Samples of bonedust were received. Members were of opinion that there was little probability of commercial fertilisers being used in this district for some years to come.

SEASON.—Attendance of members was interfered with by wet weather. The rain, however, has made a marked improvement in the prospects of the season, as before it came there was little chance of getting even seed back, whereas now with fair weather during October the district may average 4bush.

Burra, September 29.

Present—Messrs. F. A. S. Field (Chairman), Jos. Flower, Jas. Scott, F. Duldig, Hon. Jno. Lewis, M.L.C., and R. M. Harvey (Hon. Sec.).

CONGRESS.—Delegates to Congress reported on proceedings of the various meetings. On the whole the discussions were exceedingly interesting and instructive.

WHEAT CROPS.—Members reported that the rain during the month had saved many crops from absolute failure. At World's End Creek, however, they would be light, though the feed was good. Otherwise crops were now reported to be looking very well, especially those drilled in with phosphates. Sheep weed was reported to be very prevalent throughout the district.

Renmark, September 14.

Present—Messrs. W. H. Waters (Chairman), Captain W. Moffatt, R. Kelly, R. V. Bostock, and E. Taylor (Hon. Sec.).

ATTENDANCE.—The only business transacted was the question of membership and attendance of members.

Morphett Vale, October 5.

Present—Mr. A. Pocock (in the chair), most of the members, and a number of visitors.

FARM OPERATIONS.—Professor W. Lowrie, M.A., B.Sc., Principal of Roseworthy Agricultural College, addressed the meeting upon "Some of the More Important Farm Operations," to the following effect:—

The farmers of South Australia have to compete, not only with each other, but with producers all over the world, and consequently must keep up with the most improved modern methods of conducting farm work. They must adopt one principal line of produce, and in that locality he supposed this would be hay. In conjunction with this sheep should certainly be kept, as the man with sheep could grow more and better hay and with less labor than the farmer without them. Pretty well every farmer favors fallowing, with the object of conserving moisture in the soil, as well as cleaning the land. They should plough up as early as possible, June being the best month. The fallow should not be worked when it is in a dry state, as this is one of the first causes of "takeall." As a rule it is not desirable to work fallow unless within a week after heavy summer rain; in that case run it over with some light implement, In spite of fallowing, it was a fact that on most wheat fields the *available* amount of phosphoric acid in the soil is not sufficient to produce a full crop of grain. The top 9in. of soil on average land contains about 1½ tons of phosphoric acid. A 15bush. crop of wheat requires only 20lbs. of phosphoric acid; but even that small proportion is not *available*, because it is not in a water soluble condition. The majority of wheat fields in South Australia, without the application of fertilisers, are incapable of producing more than 10bush. to 15bush. per acre; but, with the aid of requisite fertilisers and fallow, should give twice or three times more. Every farmer should try experiments frequently to test the deficiencies in his soil, because those fertilisers which give good results at present may prove to be ineffective later on through deficiency of some other necessary constituent of fertility. As a rule the most readily soluble manures should be used on limestone soils. On black and tenacious soils the less soluble fertilisers are occasionally the best, though generally the more soluble they are the more profitable the manures will be. Under present conditions superphosphate is the most important manure. It consists of phosphate of lime rendered soluble, and may be either bone or mineral superphosphate. Bone super. may contain a small percentage of nitrogen, but not to any valuable extent. Bonedust is, roughly, three parts lime and one part phosphoric acid. By treating this with sulphuric acid two parts of the lime are taken out to form gypsum, and the remaining one part of lime continues in combination with the one part of phosphoric acid, and is very readily soluble in water Bonedust is far less soluble, and might lie in limestone soil for years without giving any good result. At present prices it will not pay to buy bonedust, and wait several years for returns. Bonedust contains 45 per cent. of phosphate of lime, superphosphate about 36 per cent., and it would certainly not pay to wait eight or nine years for this small extra amount. In England the all-important manure for cereals is nitrogen, applied in the form of sulphate of ammonia or nitrate of soda; but in South Australia, owing to the difference in rainfall, the phosphates are more important. Guanos are so variable in quality that every purchaser of a quantity should have it analysed Some guanos have next to no value. Care should be taken that the guaranteed analysis is the percentage *soluble in water*, and not in citrate of ammonia. Great care should be taken in mixing manures. One farmer had mixed basic slag with superphosphate, and by so doing had reduced the soluble phosphates to 2 per cent. of the mixture. The majority of drills at present in use are by no means perfect for sowing manures; cone drills should be avoided. Nitrogenous manures would be wasted on peas, as they gather their supplies of nitrogen from the air. superphosphate is best for peas. Until the land has got back into good heart 2cwts. per acre of superphosphate should be applied annually for cereals. It is far preferable to drill seed and manure together, though in special cases it might be best to drill them separately. Sulphate of ammonia, up to 75lbs. per acre, might be drilled in experimentally with super. and seed. It is not advisable to harrow too soon after ploughing for fallow, unless the land is very weedy, in which case harrow at once.

Wandearah, October 4.

Present—Messrs. G. Robertson (Chairman), E. H. Eagle, W. Davidson, W. J. Fuller, E. Jacobs, W. Roberts, G. Collins, W. Halliday, and C. E. Birks (Hon. Sec.).

DAIRYING.—Last month Mr. G. S. Thomson visited the district, inspected several of the farms, and gave an instructive address on dairying. Mr. E. Jacobs read a paper upon the same subject at this meeting. The industry has rapidly progressed lately in this district, which is well adapted through the good quality of its pasturage, though the climatic conditions are not always favorable. Co-operation is required, and there are quite enough cows in the district to keep a good strong dairy factory going all the year through.

Murray Bridge, October 14.

Present—Messrs. F. H. Wurm (Chairman), John Cowan, H. Schubert, W. Schubert, B. Jaensch, J. C. Jaensch, J. Stocker, R. Edwards (Hon. Sec.), and one visitor.

EXHIBITS.—By Mr. H. Schubert, sheaf of wheat from seed sown about Easter, ears filled, grain almost mature; also several malformed ears similar to others grown on same spot last year. Mr. W. Schubert tabled a plant of species of Zygophyllum, which is rare in this locality.

FENCING.—Mr. B. Jaensch read the following paper:—

The best and most durable timber for fencing is, undoubtedly, redgum; but as it is scarce in many places, and expensive to procure from a distance, farmers, as a rule, take such timber that is most ready at hand. I have never used any other than redgum and pine, and can say nothing about other kinds of timber for fencing purposes. Redgum and pine are about the only timbers I know of that will not be attacked by white ants. About this part of the Lower Murray pine is principally used. Pine posts should be cut when the sap is down, barked, and left to dry for at least nine months before erecting same; otherwise they will rot off in four or five years, more especially if young trees are used, which are not worth putting up. When erecting a fence strainers should not be less than 9in. in diameter at the small end, and redgum, if procurable and struts not less than 6in. at the small end, as much of the durability of a fence depends on good strainers and struts. Strainers should be at least 2ft. 6in. in the ground, and posts 1ft. 9in. Strainers can be put ten chains apart, providing the holes in the posts are bored straight and with ⅜in. bit. This is a good distance to strain, and the wires, if properly strained, will remain tight much longer than they will on a short strain. The posts should not be more than from 9ft. to 10ft. apart. I find that a fence 3ft. 9in. high with 3in. stout barb wire stapled on top of posts, the two next wires, No. 8 steel, 11in. and 8in. apart, the next three, No. 10 steel, 8in., 6in., and 6in. apart down, a good fence, and sheep and cattle-proof as long as the wires are kept tight. The wires that distance apart prevent cattle from reaching through, and a beast that will jump a fence 3ft. 9in. high will also attempt to clear a fence 6in higher, and more liable to hang on the barb on top. In loose and sandy soil, especially in dry soil, posts can be quickly and more firmly rammed with an iron bar 1¼in. thick cut straight across.

Port Pirie, September 23.

Present—Messrs. T. Johns (in chair), G. M. Wright, H. B. Welsh, T. Gambrell, T. Jose, W. Wood, R. J. Ferry (Hon. Sec.), and one visitor.

CO-OPERATION.—Mr. T. Jose read a paper on this subject to the following effect.

Most producers are well acquainted with the difficulties connected with the disposal of the numerous minor products of their industry, such as poultry, eggs, butter, hams, bacon, fruits, honey, cheese, sheepskins, tallow, lard, &c. The producer often is obliged to accept whatever price the dealer may choose to offer, or else lose the sale altogether. The advantages of co-operation were well understood in America Two or three years ago the farmers near Morgan were carting wood to the railway and selling to the agent of an Adelaide wood merchant for less than 4s. per ton, and had to take part of the payment in stores. They formed a co-operation, set up an agency in the city, and now get about 7s. per ton. He contended that Port Pirie was well situated for co-operation. There was an increasing population, a railway to Adelaide, Broken Hill, and other large centres. With a central depôt and a good manager it would be possible to have produce forwarded to centres where the best demand existed, and he could send large quantities at short notice to distant places where top prices and a good demand existed. Perhaps the Farmers' Union could extend its scope by undertaking the sale of produce other than wheat and wool. It could hold sales for perishable products once or twice a week, and when there was a glut of other produce it could be stored for a time till markets improve. Pastoralists are combined, and so are laborers, but producers are so divided that they can be readily attacked. He thought there should be branches of a co-operative union in every centre of production throughout the colony, and the union might also establish some sort of an exchange for seed, stud stock, &c.

In a discussion which followed, members approved of the principles enunciated, and unanimously resolved to do all in their power to establish a good system of co-operation.

Meadows, Otcober 2.

Present—Messrs. J. Catt (Chairman), T. B. Brooks, T. Usher, G. Ellis, G. T. Grigg, W. Nicolle, W. J. Stone, G. Usher, and H. W. Wade.

POTATOES.—Mr. G. Usher tabled samples of potatoes grown by himself from seed supplied by Mr. Krichauff, Chairman of the Central Bureau, planted on February 9 and dug during April, producing ¾cwt. from 7lbs. seed. These were very good, and seed was distributed among members for further trial and propagation, as well as to test keeping quality.

Rural Industries and Public Schools. — Members were strongly of opinion that experimental plots should be cultivated on all school grounds where the teachers are competent to conduct experiments. Mr. Griggs thought the children should be taken occasionally to a practically-conducted farm to be instructed as to the work in progress. Mr. Stone thought it would be better for a practical farmer to visit the school and instruct the children.

Cherry Gardens, October 16.

Present—Messrs. T. Jacobs (in chair), J. Lewis, C. Lewis, G. Brumby, E. Wright, and C. Ricks (Hon. Sec.).

Season.—Members report that some of the wheat crops were looking very yellow at the bottom of the stalks. The severe frosts have also done some damage. Matters of local importance were discussed.

Millicent, October 5.

Present—Messrs. R. Campbell, (Chairman), S. J. Stuckey, H. F. L. Holzgrefe, H. Hart, L. Oberlander, B. Varcoe, H. Warland, W. H. Rich, H. A. Stewart, and R. W. Foster.

Meetings.—It was resolved to give greater publicity to meetings of the Branch by affixing a notice-board at place of meeting, giving date of next meeting, subjects to be discussed, and inviting all interested to attend. It was also decided to ascertain cost of a monthly advertisement in the local newspaper.

Improvement of Roadster Stock.—Mr. W. R. Foster read the following paper:—

Lest I should be misunderstood, I will state just here that I do not advise the use of that nondescript animal the colonial roadster as a sire. Each breed of horses that I intend to mention as being, in my opinion, an improvement on our present stock is a pure and distinct breed. That there is plenty of room for improvement of roadster stock may, I think, be taken for granted. One of the principal reasons why our light horses are so inferior is because nine out of ten individuals who own a light mare are fired with an ambition to breed a winner of a Tantanoola Bracelet or a Beachport Cup, and, in order to reach this pinnacle of fame, they secure the service of some flat-ribbed, spindle-shanked, broken-down, sprint racer to mate with a mare not suitable to breed from, no matter how mated. In order to have good and good-looking roadsters, a strong roomy mare, well-proportioned, full of quality, and having good action, might be mated with a sire of any of the following breeds:—The English Hackney, Cleveland Bay, French Coach Horse, Arab, or a powerful, low-set, well-proportioned thoroughbred with good head and neck, good top and round barrel, powerful quarters, with plenty of muscle behind the stifle; not an angular flat-rumped animal. He should be full of vigor and action and sound in wind and limb. Some time ago I received, in a cutting from an English paper, an account of a sale of hackneys. The sixty-two horses offered, all of which were sold, realised 3,779 guineas, an average of 55½ guineas. The reporter speaks of this breed as a type of horse that is the admiration of prince and peasant, and of their style and action as wonderful. To see a mare of this breed, with a foal at her side, trotting round an English grass paddock, is a sight worth walking many miles to witness. Another breed of horse, bigger and taller than the hackney, is the horse of the old coaching days of England. This breed is called the Cleveland Bay. Mr. J. E. Lecky, in a paper "Roadster Stock," read at a meeting of the Davenport Branch of the Agricultural Bureau, describes the Cleveland Bay as a tall, powerfully built, bony animal, averaging 15 hands 3in. in height, head lean and well-set on crest and withers invariably good; round barrel, clean-limbed, and a coat like satin. These are active, powerful animals, with excellent capabilities for draught and great endurance, speed from six to eight miles per hour at a trot, or ten to twelve miles at a canter under any weight. The pure Cleveland is bright bay and invariably has a good loin and beautiful quarters, and although active and showy, is usually a good-tempered animal. On the light soils of some parts of England they are occasionally used in the plough and harrows, and if the driver happens to carry too much condition his lot is not a happy one. The *American Agriculturalist* for May, 1899, gives the following description of the French Coach Horse :—"The recently-introduced coach horses of France have proved to be a great acquisition to the horse stock of the United States. They have come rapidly into prominence amongst American breeders, and seem destined to fill an important place between the light road horses and the heavy draught breeds. The French coach horses are high-bred, combining the blood of English and Arabian thoroughbreds with that of the Norfolk trotter. For two hundred years the French Government has maintained horse-breeding establishments, where every effort has been used to keep up to the highest standard. The total number of stallions in these has gradually increased, until at present not less than 2,500 are owned by the Government. There is also a class of approved stallions in the hands of individual owners, which include coach, draught, and other styles of horses. Of the Government and approved coach horses nearly, if not quite, all trace back by different lines to English thoroughbreds and to the famous Norfolk trotter, Phenomenon, with an occasional dash of blood from native Arabs brought directly from the desert. With these three for foundation stock, a style of horse has been developed which combines symmetry, good size, and great nerve power with stylish and graceful carriage ; they weigh from 1,150lbs. to 1,400lbs., have blood-like heads, powerful shoulders and flanks, clean limbs, perfect feet, and style of action which bespeak their high lineage. They have not the speed of the light American trotters, but are admirable as coach, brougham, or carriage horses. Crossed on the native mares of the country they produce a grade which comes as near as anything can to answering the call for a general purpose horse." Now each breed of horses I have described is a pure breed, and the animal carefully bred to their own particular type ; any not in accord with the standard is not bred from. The fault in this country is that there is no particular type. Take, for instance, a class of 12-stone hacks at one of our shows. There are some good horses among them, but there are seldom two of the same type, while those few animals that are fairly good are more the result of chance than of care or skill in breeding. A fairly good animal may occasionally be bred from a sire whose pedigree is of a very mixed character, but for one good animal there are generally twenty not worth rearing, whereas in case of animals which have been bred to one particular type for many generations the progeny will almost always be true to standard. Although race horses are pure bred they are not bred to any particular type ; symmetery is neglected and everything is sacrificed for speed. This may or may not be good from a sporting point of view, but it certainly does not improve this beautiful breed for any utility purposes. There is another remarkably useful breed of horse, the Norman Percheron, well-known and popular in France and America, for a description of which see Mr. Lecky's paper, *Journal of Agriculture*, March, 1899. The name "hackney" seems to me rather misleading, because although there are saddle horses their proper place is in harness.

Mr. Stuckey agreed that the pure-bred Arab would considerably improve local stock, but many of the reputed Arab horses were not the true type. He had seen as many as 400 pure Arab stallions in one stable. Mr. Holzgrefe thought that one reason why local stock was so inferior was that the mares were so badly kept that their progeny did not get half a show ; in fact, the way horses of all descriptions were generally kept was downright cruelty. There was much room for improvement both in draught and light stock. He did not consider there was a first-class draught stallion in the district. Members agreed that a high-class horse, as described by Mr. Foster, would not get enough patronage in the district, as light kinds of stock are not much in demand.

DARLING PEA.—Mr. Holzgrefe tabled a plant known as Darling pea (Swainsonia sp.), which is very plentiful in the district. This is at times poisonous to stock which eat it.

CATERPILLARS.—Mr. Stuckey reported caterpillars being destructive to young plants, and was recommended to adopt the bran, treacle, and arsenic remedy.

MINERAL PHOSPHATES.—The Chairman mentioned that £500 was offered by the Government as a reward to anyone discovering deposits of mineral phosphates in payable quantities. He suggested that samples of natural phosphates should be sent to each Branch, so that all people might be on the lookout for similar substances. They might be making roads and building houses with mineral phosphates, as was the case in Florida at one time.

PEACH APHIS.—Mr. Hart had used tobacco wash effectively for peach aphis. Resin wash killed the insect, but sometimes injured the foliage, but if made with common washing soda in place of caustic soda it is not so injurious. Mr. Hart said the most effective cure is to cover the tree with a tent and fumigate with tobacco smoke. [That is the most effectual cure.—Gen. Sec.] A heavy smoke from weeds to windward will do a lot of good. Mr. Rich had tried soapsuds around the base of the trees with good results, but this is effective only when done just when the sap begins to rise and the leaf-buds begin to swell.

Lyrup, October 4.

Present—Messrs. T. Nolan (Chairman), G. A. Bollenhagen, D. Thayne, A. Weaver, D. J. Tree, J. Sykes, W. H. Walling, O. Klemm, P. Brown, A. Menzies, A. Pomeroy, W. H. Wilson (Hon. Sec.), and two visitors.

Aphis.—Mr. Menzies reported successful treatment of aphis on almond trees with wash made with 4ozs. tobacco, half a bar common soap, and 1gall. of water, applied warm by means of a soft brush.

Willows and Wells.—Mr. Menzies wished to know whether the roots of a willow tree growing near to a boarded-up well would be likely to do any injury to the water in the well. [No!—Gen. Sec.]

Wilson, October 14.

Present—Messrs D. McNeil (Chairman), W. H. Neal, H. Need, T. Matthews, J. H. Gill, R. Rowe, A. Crossman, T. Barnes, J. Coombes, R. Rowe, and A. Canning (Hon. Sec.).

The Scope and Work of the Bureau.—The Hon. Secretary read a short paper on this subject, of which the following is the substance:—

I take the scope of the Bureau to mean the aims and possibilities, and the work to mean what is and can be done individually by the members. The aim of the promoter of the Bureau was to make it helpful to all by the interchange of ideas, relation and criticism of the various experiences of members, and in this way to advance the welfare of the producers generally. That something in this direction has been achieved no one who has followed up the operations of the various Branches and the reports of the Minister of Agriculture can doubt. As the General Secretary says, "There is practically no limit to the scope of our usefulness," and he looks upon it as really as a co-operative society, whose usefulness will depend entirely upon the extent to which the individual members are imbued by a true co-operative spirit. Each Branch is practically left to decide what its scope shall be, and it therefore rests solely with its members what the extent of its operations shall be. My own idea is that the Branch is practically a society to look after the interests of the producers in its own locality with the Central Bureau to look after the interests of the Branches as a whole, and the producers generally. To make the Branch a success each member must accept his individual responsibility and take a fair share in the discussions. The members should look upon it as a matter of honor to take their turn in being responsible for initiating a discussion or writing a paper. The work of the Branch is not limited to agriculture only, but may extend to improving the social life of the producers and encouraging the desire to make farm life more attractive. To obtain a good idea of the work of the various Branches the *Journal of Agriculture* should be carefully studied, and by comparing the experience of other members with his own experience the reader cannot help but be the gainer. To make the meeting helpful and instructive each member should take a note of anything out of the ordinary that he notices and bring it forward for discussion. Anything that may happen to prove of advantage to himself may prove of value to the other members, and he should acquaint them with the experience.

Treatment of Brood Mares.—The Chairman asked whether feeding crushed wheat and dry chaff to in-foal mares would be likely to cause slipping of foals. Mr. Rowe thought an excess of dry chaff might be injurious, but Mr. Neal thought injury more often resulted from weakness, due to want of feed than to too much chaff or wheat. Crossing deep creeks after drinking was likely to cause slipping. The general opinion was that crushed wheat feed in reasonable quantities would not cause any injury. Mr. Neal asked opinion of members as to working mares in fool. Mr. Rowe thought light work nearly up to foaling would do no injury, but they should not do heavy work within two or three months of foaling. The general opinion was that with mares in good condition light steady work would do them more good than harm.

Dawson, October 14.

Present—Messrs. R. Renton (Chairman), C. F. W. Just, A. J. Hooper, W. Kelly, C. H. Meyers, O. Muller, F. Schibella, A. F. Dempsey (Hon. Sec.), and four visitors.

DAIRYING.—Necessary arrangements were made for care of bull offered to the Branch by the Department of Agriculture. It was decided that the fee for service be 2s. 6d.

MEMBERSHIP.—It was decided to notify members who have not been attending meetings that unless they will give an assurance that they will attend regularly in the future their names will be struck off the roll.

CONGRESS.—Mr. Muller reported on proceedings of the Annual Congress, and also on his visit to the Agricultural College and to the Produce Depôt.

NEW WHEATS.—Mr. Muller tabled samples of Gluyas and Eclipse wheats grown from seed obtained from the Telowie district. He was well pleased with the appearance of the two wheats; the former was an early variety, while the latter, though showing more growth and extra large ears, is about two weeks later in maturing. Members were favorably impressed with these two wheats, and it was decided that at next meeting members bring with them average samples of the different wheats grown by them for comparison.

Kapunda, October 7.

Present—Messrs. H. T. Morris (Chairman), T. Scott, Pat. Kerin, W. Flavel, J. A. Schultz, G. Teagle, and Peter Kerin.

CONGRESS.—Mr. W. Flavel reported upon the proceedings at the Eleventh Annual Congress of the Agricultural Bureau in Adelaide. He was much pleased with the proceedings, and particularly with Mr. J. W. Dall's paper on "Hindrances to Successful Farming." Mr. Flavel then recounted some of his recollections of the early days, when credit was almost unknown; when farmers ploughed with a single plough, reaped with sickle and hook, thrashed with the flail, or trod out or rolled out their wheat, and then he traced our progressive system up to the present date, including extensive credit, which he regarded as one of the principal hindrances to successful farming.

Port Germein, September 30.

Present—Messrs. G. Stone (Chairman), W. Crittenden, W. Mortess, W. Broadbear, P. Hillam, C. O'Loughlin, and A. D. Thomas (Hon. Sec.).

CONSERVATION OF FODDER.—The Chairman was of the opinion that many farmers are very improvident, and do not conserve the straw and chaff in years of plenty, with the result that their stock suffer during periods of scarcity. He had always made it a rule to provide sufficient fodder to carry his stock over two years. He had not seen much ensilage in the district, but was convinced that it would be of much value where dairying is carried on, and every farmer owning cows should provide for ensilage whenever there was an abundance of herbage, as this will keep good for several years if properly made and protected. In discussion, members recommended reaping with the binder, thrashing by machine, and saving all the straw, cavings, and chaff. It is desirable to have all land cleared of noxious weeds, and secure clean straw. Some recommended reaping and binding the straw after the wheat had been gathered by the stripper.

Norton's Summit, September 16.

Present—Messrs. J. Jennings (Chairman), J. J. Bishop, J. Pellew, and W. H. Osborne (Hon. Sec.)

PHYLLOXERA.—Attention was directed to the importation of vegetables from Victoria, and to the possibilities of introducing phylloxera, San Jose scale, codlin moth, and other pests. Members wished to know if any precautions were taken to prevent such pests being introduced. [Every reasonable care has been taken.—GEN. SEC.]

Mount Gambier, October 14.

Present—Messrs. J. Watson (in the chair), M. C. Wilson, A. J. Wedd, T. H. Williams, J. Dyke, J. Bowd, J. C. Ruwoldt, W. Barrows, and E. Lewis (Hon. Sec.).

OBITUARY.—The Chairman (Mr. Jas. Umpherston) wrote expressing his sorrow at the loss sustained by the Branch in the death of their fellow member, Mr. Thos. Williams, of Mooiak, who had done so much to advance the agronomical industries of the district. Several members spoke of the estimable character of the deceased gentleman, and it was resolved to send a note of condolence to the widow and family.

AYRSHIRE BULL.—It was announced that a pure-bred Ayrshire bull had been loaned to the Branch by the Department of Agriculture, and Mr. Ruwoldt had agreed to take care of him.

TUBERCULIN TEST.—Mr. T. H. Williams read the following:—

Dr. Robert Koch, the eminent German bacteriologist, discovered, about 1882, a specia bacillus in the diseased tubercular tissue and sputum of man and animals. He succeeded in making pure cultures of this bacillus, with which he inoculated animals, and reproduced lesions identical with tubercular consumption of man and cattle. The doctor continued his researches, and in 1890 announced that the poisonous products of the tubercle bacillus were found to counteract the effects of the inoculation on animals of tubercular material, also that its injection had proved the presence of the disease. Tuberculin is prepared from an extract of glycerine mixed with the poisonous products the doctor isolated from the bacillus. Since Dr. Koch's discovery tuberculin has been applied successfully all over the world by experts for the purpose of diagnosing tuberculosis in cattle. In Australia Mr. Cameron, the veterinary surgeon of the Victorian Health Department, has, with the aid of tuberculin, succeeded in finding a great number of dairy cows affected with tuberculosis, which revealed no symptoms before its injection. Every week is revealing the presence of tuberculosis in our herds, and stockowners should avail themselves of the valuable diagnostic means we now possess in tuberculin, and do their best to eradicate the disease. The writer has applied the tests to herds in the South-Eastern District, and during the past week seven milch cows—none of which showed any symptoms of tuberculosis before the tuberculin was injected—all reached high temperatures, rising as high as 106·1. The *post mortems* on these animals revealed tubercular abscess in both lungs, masses of new inflammatory growths on the chest wall and midriff, in the liver, and intestines. In some cases the lesions were quite of recent origin, and were evidently infection taken from water (dirty water-holes) or the pastures, where badly-infected cattle had watered and fed. In conclusion the writer would sincerely urge stockowners to face this serious matter, and avail themselves of the tuberculin test if they have had any cases of tuberculosis among their cattle, or have any reason to feel doubtful as to the health of their stock.

Mr. Williams also said that in one animal there were not enough tubercles to fill a cup, and yet the temperature of that animal had risen to 106° F. The method of testing was a scientific one, but he was willing to show anyone who wished to learn how it was done. The experiments cost about 1s. per head. The great bulk of evidence went to show that the tuberculin test is perfectly reliable, and the greatest authority in the world on the subject held that opinion. The great point was to get proper tuberculin. All the cattle referred to were the progeny of a bull that was affected by the disease. His opinion was that the water or the pastures had become contaminated, and his opinion was that the disease is not hereditary. During the three months ended in September twenty-seven cases of tuberculosis had come under his notice, and in nine cases the milk was affected. He believed the health authorities had power to stop a man in disposing of milk if it were believed the herd was tuberculous. If the tuberculin test reacted he would not use the milk from such a cow. She should be fattened and killed. The flesh would not be unsafe to eat if thoroughly cooked. He did not think more than 2 per cent. of the cows in the district were affected, but of the herd referred to, which was in another district, seven out of twenty-seven were infected.

POULTRY DISEASES.—Mr. Dyke mentioned that some fowls recently introduced had died, and diphtheria was supposed to be the cause. Some members would decline to exhibit their poultry at the forthcoming show if a certain owner were allowed to compete.

Robertstown, October 18.

Present—Messrs. N. Westphalen (Chairman), J. E. Milde, H. Rohde, H. Kotz, A. Rohde, H. Farley, F. Hagley, J. Armstrong, and S. Carter (Hon. Sec.).

HOW TO LAY OUT A GARDEN.—Mr. H. Rohde read the following paper on this subject:—

A beginner often makes the mistake of choosing the wrong position and also the wrong ground for a garden. My opinion is that any person selecting a site for his house should at the same time choose a piece of suitable land for a garden, which should be as near as possible to the house. He should also choose a site for a dam, which should be on higher ground, so as to enable him to use any overflow to flood his garden, and, when his circumstances permit, to lay pipes from the dam to the garden for irrigation purposes. By flooding a few plots during the wet part of the year it will be found that it does not require a large quantity of water to keep small plots of various kinds of vegetables growing, which will be found very acceptable in the hot weather. It is my belief that the more vegetables a person consumes the healthier he will be. Regarding cultivating and planting the owner must use his own judgment. No doubt there will often be failures, but we have to contend with that in every pursuit. Many farmers and landholders will perhaps say, "I have enough work to do on the farm, and can buy vegetables as cheaply as I can grow them." That may be quite true, but I am sure that he will find that what he grows himself will be consumed with more relish than what he buys; besides, it can be had quite fresh and when required. As regards the work to be done, after the ground is once thoroughly broken up it is quite easy, and where there is a family much can be done by the children under the superintendence of their mother. This will awaken an interest in the children to nurse and protect all useful plants, instead of wantonly destroying them, as is often the case. A manure pit should be dug in a convenient place, where all manure, rubbish, bones, ashes, &c., may be collected. This will be found very convenient, both as a place in which to collect all rubbish of any kind and easy to come at when required for manuring purposes. It would be well to have the garden laid out on sloping ground, with the paths running up the slope. The paths should always be higher than the plots, with courses on each side for conducting surplus water from the dam on to the plots. .

DISEASED WHEAT.—Mr. A. Rohde tabled sample of wheat 3ft. high, nearly white in color, and with no grain in the heads. About the joints there appeared slight signs of sap being present. The wheat was affected in patches, which were gradually increasing in area. Some members thought this was caused by some insect attacking the roots, others put it down to frost, whilst some thought there was something wrong with the soil in the patches.

CONGRESS.—Messrs. Hagley and Armstrong reported on proceedings of Congress.

STOCK COMPLAINT.—Mr. H. Rohde said at previous meeting he reported one of his pigs to be ill. The Chief Inspector of Stock suggested worms as the cause of the trouble, and on killing the animal he found this to be so, the worms being very numerous.

Davenport, October 5.

Present—Messrs. W. J. Trembath (Chairman), J. E. Lecky, F. B. Rathbone, W. Penna, W. Hodshon, G. Hadlow, J. Julian, J. Roberts (Hon. Sec.), and two visitors.

ANNUAL REPORT.—In an interesting address the Chairman reviewed the work of the past year, and referred to matters wherein they could improve the working of the Branch. The dry seasons, while temporarily depressing the spirits of the farmers, had not destroyed their vitality, and although their failures had influenced in an unfavorable way the working of the Bureau they had good grounds for claiming to have achieved a fair measure of success. The papers read at the Bureau meetings had been instructive and had been freely criticised, which he considered a promising feature. He wished to impress on each member the necessity for a full and true conception of his individual duties and responsibilities as a member of the Bureau, which was not simply a mutual admiration society, but an important part of a great educational machine whose work is noted and weighed by kindred organisations throughout Australia, and in fact outside Australia. He wished to suggest two or three points by which they could increase the usefulness of the Branch, and excite a wider and deeper interest in their meeting. First, by a systematic conduct of business; second, by sustained individual interest; and third, by the establishment of a library and museum bearing upon agronomical and industrial matters. No difficulty should be experienced in carrying the latter idea into effect. The pecuniary obligations would be light compared with the advantages to be gained. Various means—such as a blockers' show—might be devised for raising the funds required. He hoped the members would give this matter their earnest consideration. During the year under review eleven meetings were held, the average attendance being seven. Six papers had been read and discussed, and various matters of interest dealt with. The Chairman was thanked for his address, and was asked to formulate a scheme for carrying out his suggestions in the matter of library and museum. The officers were thanked for their services during the year and were re-elected.

CONGRESS.—The Chairman and Mr. Rathbone reported on proceedings of the annual Congress.

HEDGE PLANT.—The Chairman said he had made inquiries respecting the suitability of the Kei or Kaffir apple as a hedge plant. The consensus of opinion was that it was preferable to the African boxthorn. Unfortunately he had been unable to procure seeds, and the price asked for plants—£3 per 100—was prohibitive.

FLOWER CULTURE.—Mr. Rathbone, referring to paper on this subject read by himself at a previous meeting, stated he had made inquiries while in Adelaide as to market for cut flowers, and ascertained that at certain seasons there was a scarcity of blooms, and a market could be found for locally-grown flowers. On the question of prices he could get nothing definite, so that the opening of an industry would be experimental. In regard to the question of extraction of perfumes, the matter was too intricate for the small grower to undertake.

POULTRY AND FOWL TICK.—A member referred to the idea held by many that poultry from the eastern side of the range and from the south would not thrive in this district. Two of the members stated they had obtained birds from Adelaide, and they were doing well. The Chairman had heard frequent complaints on this point. The water, strongly impregnated with magnesia, and consumption of fine sand were generally blamed. He thought injudicious feeding and prevalence of ticks were more often the cause of the birds dying. Flowers of sulphur blown into the crevices and joints of timber used in the fowlhouse had been recommended, and, combined with careful feeding and clean water, they should have no trouble in keeping the fowls healthy.

Mount Remarkable, October 19.

Present—Messrs. A. Mitchell (Chairman), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, H. B. Ewens, J. B. Morrell, T. S. Bishop, and T. H. Casley (Hon. Sec.).

EARLY WHEATS.—At previous meeting Mr. Casley tabled Bartlett's Crossbred wheat 3ft. 6in. high, with good plump ears, considered a fine sample and suitable for this district. He also showed Indian King wheat sown at same time and under same conditions—a failure. Both wheats were presented to the Bureau for distribution by Mr. R. Marshall, of Templers.

CONGRESS.—Messrs. Jorgensen and Casley give interesting accounts of the proceedings of the Annual Congress, also of their visit to the Produce Depôt.

MAGPIES.—The Hon. Secretary drew attention to the usefulness of the magpies, which at this season could be found in the vineyards destroying caterpillars and other insects, while the crows were waiting for the grapes to ripen. [And getting fat in the meantime on grubs and other pests.—GEN. SEC.]

Quorn, October 19.

Present—Messrs. R. Thompson (Chairman), F. Herde, J. B. Rowe, G. Altmann, J. Rock, W. Toll, C. Patten, J. Johnson, H. Cowan, H. S. Stacey, Jas. Cook, and A. F. Noll (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year ten meetings had been held, with an average attendance of 8·7 members—a considerable improvement on the previous year. Five papers had been read and discussed; they had had a visit of inspection and lecture by the Dairy Instructor, and had secured the loan of one of the Jersey bulls purchased by the Department of Agriculture. He wished to impress on the members the necessity for taking it in turn to be responsible for the business of the meeting. In the past it had been left too much to a few to provide papers or initiate the discussions. It might be better for two members to be responsible for the business of each meeting. The officers were thanked for their services and re-elected.

CONGRESS.—Messrs. Rowe and Noll reported on proceedings of the Annual Congress.

FERTILISERS.—Mr. Rowe said he was misrepresented in the Congress report in stating that he did not believe fertilisers would do in the North. What he said was that manure—meaning stable manure—did no good in the North in a dry season, as the crop would blight. The Hon. Secretary said three years ago he had a few acres drilled in with superphosphate and Thomas phosphate, and this year the benefit from the fertilisers could be easily seen. He had also a good crop on land where he spread stable manure. A discussion ensued as to whether it was better to use the manure fresh from the stable or let it rot first. Most of the members agreed that fresh manure caused the strongest growth. [See article in another portion of the *Journal* on "Farmyard Manure."—GEN. SEC.]

CONFERENCE OF FAR NORTHERN BRANCHES.—It was decided to hold the Conference of Far Northern Branches of the Bureau at Quorn some time in February, 1900, and to hold a show of fruit and other items of interest in connection with same.

Amyton, October 19.

Present—Messrs. J. Gum (Chairman), J. Kelly, A. Gray, John Gray, W. Gum, W. Mills, W. Hughes, H. Gray, H. Turner, T. Gum, R. Brown, and S. Thomas (Hon. Sec.).

FOWL DISEASE.—Mr. Gray said several persons had examined his fowlhouse and roosts, but no ticks could be found. After cramp in the toes and inability to stand, diarrhœa followed. Several members had fowls similarly affected. [Remove the fowls to fresh ground, feed them with green food as well as grain; be sure that the water is clean and cool. Sprinkle lime freely over the places where the fowls have been chiefly congregating, and if possible dig it over. The great probability is that the fowls have a mild form of fowl cholera.—GEN. SEC.]

"SHEEP ON THE FARM: WILL THEY PAY?"—The following is the substance of a paper read by Mr. William Gum:—

With fair seasons and proper management his experience showed that it will pay well to keep sheep on farms, and no farm can be complete without them. There are other important branches of farm industry that ought not to be neglected, such as dairying, poultry, and pigs. Wheat must continue to be our staple product, but the other lines cannot well be ignored. The seasons have been so uncertain that we cannot place our sole reliance upon wheat, and we must reduce the risk by adding some of the other products to our list. The initial difficulty in starting to keep sheep on the farm is the cost of sheep-proof fencing and dividing into paddocks of fifty to 100 acres. Small lots of sheep need small paddocks and frequent shifting in order to make the best use of the feed. Good fences are of great advantage in rearing all kinds of livestock, especially calves. It is a pleasure to keep cattle that have been reared inside sheep-proof fences. No fence of less than four wires is capable of resisting the trespass of cattle, especially if young, so that the extra two wires to make a fence sheep-proof will not cost much. Five steel wires, with one barb wire on top, if properly constructed, will resist trespass by sheep or small or great cattle. A farm of 900 to 1,000 acres should be divided into twelve or fourteen paddocks, with 450 acres under crop, 250 acres fallow, and 200 acres to 300 acres for grazing. He would purchase 100 four-tooth maiden ewes at say 8s. off the shears, and reckoned the outcome as follows:—

Increase, eighty lambs, worth 8s.	£32
Wool from eighty ewes, average 8lbs., at 6d.	16
Saving in butcher's bill	12
Twenty skins, at average of 3s.	3
Saving in scarifying 160 acres at 1s. 6d. per acre	12
	£75

These figures represented a profit from land which otherwise would not be utilised. If there were 250 acres to be fallowed in three paddocks the sheep would be in the first paddock, and the cattle and horses in the second, whilst the third was being broken up. Then the sheep would follow the larger stock through all the paddocks, and by the time the whole was fallowed there would be quite enough greenstuff in the first to keep the sheep going, and so on through the rest till harvest time, when they will follow the larger stock through all the stubble paddocks. He had seen the fallow so thick with buckbush (Salsola kali) that it would carry the sheep through all the summer. He thought the best breed of sheep for farmers is the merino, as they are quiet and not bad on fences. Do not breed rams, as they are very liable to deteriorate, but purchase the best that can be afforded. If there is only a small flock it would be better to hire one or two rams, as this will save the trouble of looking after them for the rest of the year. The best time for lambing is in April, by which time there is generally a little green feed. By October the lambs should be worth 8s. to 10s. each in the Adelaide market. He had had lambs which, at six months of age, turned the scale at 40lbs Do not allow the ram to run with the flock all the year, else there will be lambs dropped all the year through, and sometimes two lambs of different ages living on the ewe at the same time. Preserving the skins is one important item. Do not hang them on wires, but across a rail in a shed, stretching them as square as possible. Two or three days later paint them with anti-weevil wash. This will take about one minute for each skin. A neighbor who took none of these precautions sent a bundle of skins to market at same time as myself. He got 2s. each, whilst I got 4s. 7d. each. Merinos are liable to have the wool grow over their eyes, so that they cannot see to feed, with the result that they get very poor and have light fleeces. It is necessary to look to this, and cut the wool away from their eyes, which will also prevent the barley grass getting into their eyes and blinding them. When shearing be sure to have the floors and yard thoroughly cleaned up, as straw and string amongst the wool brings down its value. For ration sheep always select those which are the worst for wool. Pelts after shearing are worth saving, and will pay for the carriage and cost of selling the better skins.

It was shown that all the proceds mentioned by Mr. Gum could not be regarded as income, as he started with 100 sheep and finished with only eighty. The Chairman thought that one-third of the land was sufficient to have under crop on a 900-acre farm if sheep were kept. Mr. H. Gray considered the estimated return from sale of lambs rather high for an average price. Mr. Gray also considered that the net price named would not be obtained, except for crossbreds.

Bakara, October 19.

Present—Messrs. H. R. Raymond (Chairman), R. Hayward, R. Wilson, F. C. H. Martens, R. Barrow, H. A. Lehmann, T. Herrmann, E. Wall, J. V. Barrow (Hon. Sec.), and two visitors.

WHEAT-GROWING.—The Chairman read a paper on "Wheat-growing on the East of the Murray." Every farmer should experiment on the best method of growing wheat. Scrub farmers, until they have cleared a large area of land, cannot easily produce anything except wheat, and they must therefore try to discover which variety of that cereal is likely to prove the most profitable. Whilst there are many adverse contingencies that cannot be guarded against, there are others that may be prevented to a greater or lesser extent. Frost, drought, hot winds, red rust, and storms are amongst the first, and fire, bunt, ear cockle, and some others are amongst the second. To prevent bunt the seed wheat must be carefully pickled in sulphate of copper (bluestone) solution. To prevent ear cockle, obtain seed from a locality where the disease is unknown, examine the seed before pickling it, remove all seeds that float in the pickle, go over the crop when it is growing and pull up and burn all plants showing the disease. If a field is already affected, leave it out of cultivation to cereals for two years, or try to grow some other crop on it. Members favor ploughing 3in. to 4in. deep, and seed should not be buried more than 2in.

Auburn, October 19.

Present—Messrs. W. R. Klau (Chairman), G. R. Lambert, J. B. Schober, W. F. Keynes, J. E. Isaacson, E. M. Dudley, O. C. H. Limbert, and Dr. J. W. Yeatman (Hon. Sec.).

OFFICERS.—Mr. G. R. Lambert was elected Chairman, and Dr. Yeatman re-elected Hon. Secretary for ensuing year, a vote of thanks being accorded to the officers for past services.

Frosts.—Discussion took place on the damage to orchards and vineyards by the frost. The frosts had been very partial, some few vineyards escaping injury, while most had suffered severely. Where the land had been cultivated immediately before the frost the effects were most disastrous. The second frost on October 17 damaged many vines that escaped the previous visitation. The fruit trees were also severe sufferers; the apricot crop will be practically *nil*, but peaches promise well.

Maitland, October 7.

Present—Messrs. H. R. Wundersitz (Chairman), A. Jarrett, C. F. G. Heinrich, P. Treasure, Thos. Bowman, W. E. P. Jury, J. Hill, and C. W. Wood (Hon. Sec.).

Congress.—Mr. Jarrett reported on proceedings on Congress, with special references to Mr. Hardy's paper "The Currant Industry," and to the discussion on "Keeping Seed Potatoes." Mr. Dall's paper on "Hindrances to Successful Farming" met with his strong approval.

Weeds.—A discussion took place on this subject, and it was decided that noxious weeds be the subject for discussion at next meeting, and that each member bring specimens of any troublesome weeds growing in his neighborhood.

Baroota Whim, October 18.

Present—Messrs. F. H. Flugge (Chairman), F. Simper, A. Raneburg, C. F. Bassen, and C. W. Hoskin (Hon. Sec.).

Ear Cockle.—Members desire more information concerning ear cockle. [The plant shows signs of ear cockle by the flag becoming crinkled and of an unhealthy dark-green color. The seeds do not develop into wheat, but are smaller and rounder, and are of a dark purple color. When crushed and damped and placed under a microscope a great number of small worms are found. These worms are possessed of great vitality, and may be dried time after time, appearing to be dead, but will come to life whenever they are damped. The grains fall the earth, and the worms begin with the young plant and finish with the grain in the ear.—Gen. Sec.].

Nantawarra, October 21.

Present—Messrs. E. G. Herbert (Chairman), J. W. Dall, A. F. Herbert, R. Uppill, Jas. Nicholls, and T. Dixon (Hon. Sec.).

Congress.—Mr. Dall gave an interesting account of the proceedings of the Annual Congress.

Sand in Sheep's Wool.—Mr. Nicholls asked for opinions as to which was the most injurious to the wool—to place sheep on the fallows just after shearing or in the wool? The general practice is to put them on fallow land as soon as shorn. Some members held the opinion that the sand that gets into wool of newly-shorn sheep remains until next shearing, while woolled sheep shook out most of the sand. Others, however, thought the sand held more in full-woolled sheep.

Exhibit.—The Chairman tabled fine samples of loquat grown by himself without irrigation. He also offered to supply members with young tomato plants.

Finniss, October 2.

Present—Messrs. T. Collett (Chairman), W. W. Heath, A. E. Henley, and S. Collett (Hon. Sec.).

Congress.—Mr. Henley gave an interesting account of the proceedings of the Annual Congress.

Officers.—The Chairman and Hon. Secretary were thanked for past services and re-elected for ensuing year.

Gladstone, October 7.

Present—Messrs. C. Gallasch (Chairman), J. Tonkin, J. King, J. Gallasch, J. Shephard, W. A. Wornum, and J. Milne (Hon. Sec.).

Congress.—The Chairman reported on proceedings of Congress. A discussion on standard weight of wheat followed.

Frost.—Mr. King tabled sample of wheat badly frost-bitten.

Conference.—It was decided that the Annual Conference of the Northern Branches be held at Gladstone about the middle of February.

Orroroo, October 20.

Present—Messrs. J. Moody (Chairman), G. Matthews, H. C. Ives, M. Oppermann, W. S. Littlecrapp, S. Roberts, E. D. Kirkland, E. Copley, J. Jamieson, R. Coulter, jun., and T. H. P. Tapscott (Hon. Sec.).

Congress.—The Chairman and Hon. Secretary gave interesting reports on the proceedings of the Annual Conference, and on visits to Produce Depôt and Agricultural College. Considerable discussion followed.

Attendance.—It was decided that the Secretary inform absenting members that the rule *re* non-attendance will be strictly enforced in the future.

Naracoorte, October 14.

Present—Messrs. S. Schinckel (Chairman), E. C. Bates, Job Wynes, H. Buck, J. D. Smith, and O. Hunt.

Conservation of Fodder.—Mr. J. D. Smith read a paper, of which the following is the substance:—

He had used thrashed straw and wheat husks (cocky chaff), which he considered to be valuable feed. Some at least of the wheat should be cut when in the dough stage and be headed. If no header is available, cut the heads off and run them through the drum of the stripper driven by horseworks. This is preferable to heading if fed loose to cows, but for chaffing the header is best. Cocky chaff should be housed before any rain falls, because it heats very quickly. All stock will eat it if well conserved, and it will keep good until next winter if necessary. Straw should be stacked at once, and will be greatly improved if each layer of a foot depth is sprinkled with salt and water. Ensilage should be done by all farmers, especially those keeping cows. Some suitable crops should be grown, and all surplus herbage in spring time can be used also from around fences and odd corners. He had tried lucern, barley, and rye with success. The first cut was used for early green feed, and the aftermath was used for stack ensilage. The grain crops should be cut when well out in ear, but not left till nearly ripe, as this is wasteful. Last spring he cut about 25 tons of grass and wild oats, which if cut directly it is well out in ear and stacked at once is much relished by all stock during winter, whilst if left to ripen in the paddock is of very little value. He sprinkled each layer of hay with a pickle made with 1lb. sulphate of iron to 10lbs common salt. All stock preferred this to good oaten hay. He found that horses, cows, and even calves would feed upon this grass hay in preference to Algerian oat hay. The grass grew again, and kept green quite a month later than where it was not cut. The stock fed on this and kept it quite bare, and yet it started early this season and grew more quickly than where the ground was protected by dry grass, besides suffering less from cold winds and frosts. Everyone should provide plenty of feed for his stock during the cold weather. It is shameful to neglect such provision, when it can be done with but little trouble and expense. There is some hard work about it, but anyone who has an objection to work should not have stock to starve and illtreat. There is money in conservation of fodder.

The Chairman agreed that much more could be done by farmers in conservation of fodder. They wasted a deal of valuable straw, and neglected to gather in other herbage that would be valuable in winter. He had tried ensilage, but failed, he thought, because he had not put on enough weight. Mr. Magarey had been very successful with ensilage, and used 2cwts. of weight to each super. foot.

IMPACTION.—Mr. Hunt said his cattle had been much troubled with impaction of the omasum (or "dry bible"), and he had been informed that it could be prevented by dressing the grass country with phosphatic fertilisers in strips —1cwt. per acre would be sufficient.

Mundoora, October 13.

Present—Messrs. R. Harris (Chairman), T. Watt, W. J. Shearer, C. Button, W. H. Mitchell, and A. E. Gardiner (Hon. Sec.).

CONFERENCE.—The Chairman, Port Broughton Branch, wrote that the Annual Conference of Northern Yorke's Peninsula Branches would be held at Bute on February 21, 1900, and invited co-operation of members.

CONGRESS.—Mr. Harris reported proceedings of Congress, and some discussion ensued on standard weight of wheat, but decision was postponed. Members were pleased at satisfactory prices realised for wool at the local sales. The Hon. Secretary wished to know the most profitable sheep for this district. It was decided that the question be dealt with at next meeting, the Hon. Secretary to notify all members.

Cradock, October 14.

Present—Messrs. R. Ruddock (Chairman), T. Marsh, J. Clark, W. Haggerty, J. Paterson, P. O'Dea, P. Gillick, J. H. Lindo (Hon. Sec.), and eight visitors.

PLOUGHING CORNERS.—Mr. Haggerty spoke on injury to horses' shoulders when ploughing round corners. When starting to fallow horses, as a rule, were fresh, walked quickly, and, if not rested frequently, scalded their shoulders. That often made jibbers of them. Ploughing all round a field (known as "field ploughing") was especially injurious, because there were no stoppages at ends or corners; but when ploughing in lands the horses always get a little rest at the ends, so that the shoulders are eased and cooled a little. Field ploughing takes a little less time and trouble than ploughing in "lands," but its disadvantages are great, because the horses tread on each other more, owing to their stepping out further on the soft ground, and by always turning the same way, with the draught heavy on one shoulder, it gave the horses sores from "bruised shoulders," and sometimes caused slipping of the muscles. He thought backbands, used with proper judgment, would help to preserve horses' shoulders when ploughing. The Chairman said he did not think ploughing round corners gave horses sore shoulders any more than ploughing straight ahead. Sores were generally caused by scalding, and an extra horse in the team would prevent that. Field ploughing saved time; and "crowns" seldom grew a crop in this part, because the rain water ran off. Horses' shoulders should be washed with cold water immediately after removing the collars. Mr. Gillick said for scalded shoulders or backs a cup of cold salted water was the best cure if applied whilst perspiration was present. He described the difference between "slipping of shoulder" and "sweening." The former was dislocation of the shoulder joint, and the latter only a displacement of the muscle of the shoulder, caused by hard pressure. Mr. Graham said in field ploughing the team should be driven right out to the point, the plough lifted, then turn the team short round. Mr. Hilder said if horses are properly harnessed and driven they will not tread each other; the off-side horse should be kept forward while turning. Mr. Boyd said field ploughing is best, and for convenience in sowing he used a line from sower to boy on horseback, with a small log to mark lands. Mr. Clarke said ploughing round corners would not cause sore shoulders, because the swingletrees made an even balance of pressure on horses' shoulders. On a vote, a large majority favored field ploughing.

Kanmantoo, September 21.

Present—Messrs. Thos. Hair (Chairman), E. Downing, J. S. Hair, T. Hawthorne, P. Lewis, J. Mullins, and A. Hair (Hon. Sec.).

CONSERVATION OF NATURAL GRASSES.—To allow of reproduction by natural seeding Mr. Mullins would lightly stock the paddocks for a year or two. Mr. E. Downing had proved that removing all stock from a paddock when the grass was seeding was a practice to be strongly recommended. The Chairman said that each paddock should have complete rest at least once in five or six years. Mr. Lewis said he found that it was more profitable to have old grass on hand than to have his stock pinched for food. Mr. Mullins had proved that rib-grass will kill stinkwort, but the rib-grass was so much liked by stock that in a few years it became extinct.

Mannum, October 20.

Present—Messrs. J. G. Preiss (Chairman), A. Faehrmann, J. A. Schulz, R. Heidrich, H. Wilhelm, G. Lenger, R. P. Scott, and H. Brown (Hon. Sec.).

CONFERENCE.—Decided to hold a Conference of River Branches late in February.

"TAKEALL."—This has been very bad this year, especially on dark mallee lands, superphosphate having no apparent effect on it. The Chairman suggested that oats should be grown on the land. [Is the land loose, hollow, and dry, through having been laid up in fallow late in the season, thus causing "root failure?"—GEN. SEC.]

ANNUAL REPORT.—Hon. Secretary reported that eleven meetings had been held, with an average attendance of eight members and two visitors.

OFFICERS.—Office-bearers were thanked and re-elected.

Mannum, September 21.

Present—Messrs. A. Faehrmann (in chair), J. W. Walker, W. Cowald, R. Heidrich, J. Nickells, C. Schuetze, and Henry Brown (Hon. Sec.).

CONGRESS.—Delegates to Congress gave instructing reports on the proceedings of the different meetings, and of the visits to the Produce Depôt and the Agricultural College. Members considered that the crowd of visitors attending prevented the visits being as instructive as they should be,

Angaston, October 21.

Present—Messrs. J. E. Swann (Chairman), F. Salter, A. Salter, A. Friend, R. Player, M. Andrew, S. O. Smith, E. Thamm, and E. S. Matthews (Hon. Sec.).

TAGOSASTE.—Members reported that the tagosaste (Cytisus palmensis) grows very rapidly after being cut back.

CUCUMBERS, &c.—The Hon. Secretary considered well-rotted farmyard manure to be best for cucumbers, marrows, &c.

BUREAU JOURNAL.—Members are very greatly pleased with the *Journal of Agriculture and Industry*, especially with the October number, and think that it would be very instructive if the Hon. Secretary would cull some of the more interesting items for discussion at each meeting. [Why leave all the work to the Hon. Secretary? Every member should take a note of anything special that may strike him.—GEN. SEC.]

FROSTS.—Members reported severe damage to fruit from late ground frosts.

Golden Grove, October 19.

Present—Messrs. T. G. McPharlin (Chairman), S. A. Milne, F. Buder, A. Robertson, J. Anderson, and A. Harper (Hon. Sec.).

SEEDS.—A lot of seeds from Central Bureau were placed in the hands of those having gardens, for the purpose of being cultivated under the most favorable conditions, to become acclimatised and increased for further distribution.

Woolundunga, October 18.

Present—Messrs. H. Aldenhoven (Chairman), T. H. Prosser, J. H. Michael, J. Grunike, J. Grieg, N. J. S. Rogers, and N. Rogers (Hon. Sec.).

ONIONS BOLTED.—Mr. Rogers showed onions bolted to seed. The plants were from seed sown in December or January last; some plants were not watered, others were watered, but the results were similar in each case. [Plants were raised too early from seed. I have, however, had very good onions from seed sown on sandy soil in January, and transplanted to heavy soil in April or May.—GEN. SEC.]

CONGRESS.—The delegates from this Branch desire to record their opinion that the Annual Congress meetings would be far more enjoyable and profitable if more strictly controlled.

ENSILAGE.—Mr. Gilbert Lewis read a paper on this subject, as follows:—

Ensilage-making consists in cutting and storing forage whilst it is green, with the object of maintaining its succulence, and retaining, as far as possible, the original nutritious properties of the fodder. The objects sought are—To provide a substitute for green feed when it is most scarce, and to convert coarse and rank natural herbage, which is not readily eaten by stock, into a more palatable foodstuff. Although Austria and Russia have made ensilage for more than a century past, it was not until a little more than twenty years ago that the attention of the Americans was first drawn to it through the medium of a French journal. A boom was the result of its first trial in America and England, and later on in Australia. All sorts of rumors were spread about its wonderful feeding value and the increased number of stock it would allow a farm to carry per acre. These rumors have at last subsided, and it now remains with each individual farmer to test the merits of ensilage on his own farm. The theoretical principles of making ensilage are easily understood, but must not be overlooked. Our endeavor is to keep the green feed as nearly as possible in its original state. Now, we all know that if a heap of green stuff is left standing it will soon begin to ferment; this fermentation is brought about by the agency of minute living organisms in the air, known as bacteria or microbes. These microbes act on the cells of the green feed, and cause heat and fermentation. They first change the starch in the plant cells into sugar, and then, if unchecked, the sugar is turned into alcohol, and finally the alcohol is converted into acetic, butyric, and lactic acids chiefly. The bacteria working these changes require air, or otherwise free oxygen, in their first stage of fermentation, but, once fairly started, they can obtain their oxygen from the various compounds in the substance they are acting upon (such as the carbo-hydrates), and can then dispense with air. It has also been found that the vitality of these microbes is destroyed at a temperature of 120° F. to 125° F., and on this latter fact the whole process of ensilage-making depends.

Sweet Ensilage is made by cutting the crop with not more than 75 per cent. of moisture in it. The best time to cut most crops is at flowering time or a few days later, but it is advisable not to let the seeds form if the crop is dirty; otherwise the land will get fouled. Cart it the day after cutting. [Or cut in the morning and cart in the afternoon when weather is hot and dry.—Gen. Sec.] Place a layer of the green stuff to the depth of about 3ft. or 4ft. in the pit or on the stack, spreading it as evenly as possible. The bacteria on the plants and in the air will at once begin work, and soon fermentation and a rise of temperature will be noticed. When the temperature has reached 122° F. add another layer of green stuff, and let this stand again until the above temperature is reached. Then add another lot, and so on, until the pit or stack is full. As soon as the top layer has reached the required temperature place some straw evenly on top, then apply pressure or weight to exclude further air. [200lbs. to each superficial foot.—Gen. Sec.] By allowing the temperature of each lot of stuff to rise above 122° F before adding more we kill all the bacteria then present, and the addition of another layer will exclude the air, and so prevent it rising too high in temperature and becoming charred. If the crop is too dry it will heat very quickly, and care must be taken that it does not exceed 155° F. This is easily prevented by putting on another layer or, if it is the top layer, by weighting it.

Sour Ensilage is made by cutting and carting the crop in any weather and filling the pit straight away, and then weighting it down. [The temperature must be allowed to rise to 120° F., else the silage will lie dead and sodden. Cut in morning, cart in afternoon. The afternoon cut is left till morning, by which time temperature will have risen enough usually. —Gen. Sec.] Fermentation then takes place very slowly throughout the mass, and as air is excluded it does not rise very high in temperature, and so the bacteria are not killed, but live on and change the sugar into aldehyde, aldehyde into alcohol, alcohol into acetic butyric and lactic acids. These acids are therefore found largely in sour ensilage. There is some difference of opinion as to the relative merits of sweet and sour silage. The latter, when fed to cows, gives as big milk yields as the former; but it is of less value as fodder for dry cattle and horses Sour silage is apt to make the cows slip their calves. According to the temperature to which it is allowed to reach the silage will vary to a certain degree. That made below 120° F. is "sour ensilage"; between 90° F. and 120° F. it is low temperature sour ensilage; between 120° F. and 130° F. there are veins of sweet and sour silage; between 134° F. and 140° F. a shade of brown is the color; between 140° F. and 160° F. it is decidedly brown: and above 160° F. it is similar to over-heated hay and its flavor denotes burning.

Stack Ensilage is made by putting down about 3ft. of straw, and then carting the green stuff on to the straw. The ends are left sloping so that the teams can drive over the stack, thus consolidating it. When the stack is about 6ft. high allow the temperature to rise to 122° F. before adding more. As soon as the stack becomes too high to drive over, cut the sloping ends off with a hay knife, and fork them on to the top. Then draw the wagons up alongside, and proceed as if building a haystack, allowing each layer to rise in temperature before adding the next. When the top is reached cover with straw, and then either put dead weights on top or use a press of some sort to exclude the air. Always tread the sides well.

Pit Ensilage is made by filling the pit a few feet at a time if sweet ensilage is required, as before stated, special care being taken to spread the stuff evenly, and so keep the sides well packed. Of the two methods the stack is initially the cheaper and requires less labor, as it may be made in the field. The loss with stacks, however, is far greater than in pits, and therefore the latter are preferable. Weights may be cheaply made by filling kerosine tins with rough concrete, embedding a loop of wire in them as a handle. Bags of sand, stone, or heavy logs are also used. In pits a pressure of at least 120lbs. per superficial foot is required, and for stacks not less than 150lbs. per square foot. Presses of various kinds are used in lieu of dead weights. The best of these are the automatic ones, which always keep an even pressure and do not require attending. Pits can be made in many ways. A square hole dug in heavy clay has been found to answer in some places, but generally results in the sides getting wet, and so spoiling. The best plan is to make a pit on the side of a hill, and fill it from the top side, and empty it on the lower side. The main point is to have the walls plumb. The walls can be made by putting in four big posts, one at each corner, and nailing slabs of wood across the sides. Then fill in behind the wood with clay, and ram well. Stone and lime, concrete, slate, or brick and cement may be used. The size of the pits will vary according to amount of silage required; 10ft. x 10ft. x 12ft. deep is a handy size. It is advisable never to make it less than 12ft. deep; 1 sq. foot of silage weighs 50lbs. to 60lbs. The walls need not be all underground; better to leave about 3ft. above the surface. An old barn or shed will often answer the purpose. When making large quantities, make two or more pits in a line in preference to having one large pit, as a smaller surface is left exposed when using the silage, and consequently less risk of it spoiling. Always roof pits well to keep out rain.

Practical Details.—Never use silage within two months after making. Chaffed, sheaved, or loose stuff may be made into silage. Chaffed makes the most even sample, but requires more labor to make. Sheaves must be packed in very closely to exclude the air. Loose silage is the most common and economical method. When feeding horses use one part silage to three parts chaff. Sour silage will scour horses, as a rule, unless well accustomed to it. Coarse stuff, as maize, sorghum, &c., must be chaffed to make it pack well. Rye makes poor silage, as it is too hard. It is best to cut crops which have been manured with farmyard manure for silage, as these are generally very dirty, so that by cutting them early the weeds are got rid of. Rank herbage growing along roadsides, in corners, &c., is also well adapted for silage. Wheat, oats, barley, rye, peas, beans, tares, and mustard may all be used, and also lucern, clover, and rye grass in good districts. Summer crops, as maize and sorghum, are preferably fed straight to the stock, as other green feed is generally scarce when they are growing. Mr. C. Rake, of Enfield, was the poineer of ensilage in South Australia, and was shortly followed by Mr. Thompson, then manager on the sewage farm. Many others have since made it, but very few have tried it in the north of this colony. As a fodder for sheep, horses, pigs, and dry cattle it would be too costly to use, except in cases of severe droughts. It may, therefore, be said that to us its only use is as a dairy fodder during the fall of the year, and as such it has no rival in the north. Any farmer keeping cows should, in a good season, cut all the available rank growths of grass, &c., and convert them into silage. As soon as the natural herbage have dried up start feeding it to the cows, and continue doing so until the green grass again makes its appearance. On this treatment the cows will give a splendid flow of milk right through the summer and autumn, when milk is, as a rule, very scarce. Better cream and nice yellow butter will also result and the cattle will keep in a thriving condition. Some stock will refuse to eat it at first, but they soon get a ravenous liking for it. There is no risk of fire with silage. Never use plants of the cabbage or turnip family when making silage for dairy cattle, as it will taint the milk.

Minlaton, October 21.

Present—Messrs. J. McKenzie (Chairman), Jas. Anderson, Jno. Anderson, J. H. Ford, H. Boundy, J. D. Mayer, S. Vanstone, Jas. Martin, Jos. Bennett, Jos. Correll (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Messrs. J. & E. Correll for the purpose of inspecting the crops and the experimental work carried out by them. The first crop noticed was a fine paddock of King's Early wheat on fallowed land, promising a good return. A splendid crop of Chevalier barley was ripening, and will be cut with the binder and thrashed. A portion of a paddock sown with Hawke's Clubhead wheat was next inspected. This gives promise of a heavy yield. A considerable area of the farm is sown with this very promising wheat, a variety raised by Mr. W. H. Hawke, of Arthurton. Various phosphatic manures have been used on these crops, principally Sugar Co.'s bone super., Ohlendorff's mineral super., and Thomas phosphate. A strip of crop sown with 20lbs. sulphate of potash mixed with Thomas phosphate will probably give the best average return. The paddock containing the stud wheats, oats, and barley, together with various experimental plots, was next examined. Plots of King's Early and Petatz Surprise wheats and Chevalier barley promise well. Petatz Surprise wheat is very hardy, stools well, and promises to yield heavily. Algerian Oats from Mount Gambier seed look well. Of the new wheats one of the most promising is a selection of Mr. J. Correll's. There are several small plots of Medea crosses, some being beardless and semisolid in the straw, while others are quite solid. A Steinwedel cross was much admired, being early, stooling fairly well, and an improvement on the old Steinwedel. A fine crop of Medea wheat will be cut for hay. A plot of Danish Island oats was much admired, it being considered to be superior to Cape oats. Near the homestead a paddock of eight acres with field peas promises a good yield. After the inspection members were entertained at tea, and a vote of thanks was accorded to Miss Correll and to Messrs. J. and E. Correll for the pleasant and instructive afternoon.

Bowhill, October 14.

Present—Messrs. A. Dohnt (Chairman), A. Groth, E. Weyland, W. G. F. Plummer, W. Towill, J. Waters, G. Knight, J. Gregory, and H. H. Plummer (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Dohnt tabled samples of Steinwedel and Gravestocks Frampton wheats to show difference between them, as some members were of opinion that there was no difference. It was decided to show riper samples of both at the following meeting. Mr. Weyland tabled samples of several wheats, also lucern grown on rubbly land without the aid of irrigation; the crop was 2ft. high and strong.

FROST-RESISTING WHEATS.—Mr. Towill wished to ascertain whether there were any wheats which resisted the effects of frost more than others. His Steinwedel and Purple Straw had suffered in their early growth, and while Dart's Imperial withstood the winter frosts, it was cut as soon as it came into ear. Mr. Dohnt had Neumann's injured, but Early Para and Gravestock's Frampton seemed to resist the frost. Mr. W. G F. Plummer thought it would be difficult to judge on this point, as so much depended upon situation; a variety injured badly in one place escapes in another. [This is a very interesting point, and well worthy of the attention of growers. On the Darling Downs the crops have been severely cut by frost, and it has been found that the varieties least injured are Belatourka, Ward's Prolific, King's Early, and Marshall's No. 3, the three latter being South Australian wheats.—GEN. SEC.]

CONGRESS.—Delegates to Congress reported on proceedings, also on visit to Roseworthy, and considerable discussion ensued.

PAPER.—Mr. Groth read a paper on "Why Farming does not Pay, and How to Make it," dealing with the matter from a distinctly political standpoint. Mr. W. G. F. Plummer said want of capital was one of the principal causes of failure. There were many farmers who would farm their land better were they in a position to purchase improved implements, manures, &c. Other members agreed.

Hawker, September 27.

Present—Messrs. S. Irvine (in chair), F. C. Hirsch, J. W. Schuppan, R. Wardell, H. M. Borgas, J. Edgeloe, C. W. Pumpa, T. Laidlaw, J. Smith (Hon. Sec.), and two visitors.

POULTRY COMPLAINT.—Mr. Laidlaw said he had cured fowls suffering from what is known as "black head." He mixed equal quantities of butter, flour, and pepper, and made into pills large enough for the fowls to swallow. Each affected fowl was given one of these pills, followed by one of Beecham's pills, with satisfactory results.

Hawker, October 18.

Present—Messrs. A. C. Hirsch (Chairman), C. W. Pumpa, S. Irvine, J. W Schuppan, T. Laidlaw, Jas. O'Loughlin, and J. Smith (Hon. Sec.).

DRILLING V. BROADCASTING WHEAT.—During the day several members accepted the invitation of Mr. H. M. Borgas to inspect the results of using the seed and fertiliser drill, also various experimental plots of wheat. The Hon. Secretary, in initiating the discussion on broadcasting *versus* drilling, expressed himself strongly in favor of drilling in the seed. Not only was there a saving in seed, but there was also the advantage that the seed was put in an even depth. It was protected from birds and ants, and the crop came more regular and even. Where the seed was broadcasted and harrowed in there must always be a considerable loss. Mr. Laidlaw considered the seedsower preferable to the drill in this district. The cost was only one-third to one-fourth of the drill, and where a man could sow and harrow in forty acres with the former, he could not do more than sixteen acres or so with the drill. He considered there would be a saving of at least 2s. 6d. per day in favor of the sower. The drill would not pay to use without manure, and he did not think their land required manure. It would produce a crop according to the rainfall. Where it would pay to manure he would certainly recommend the use of the drill. Mr. Irvine said Mr. Laidlaw would alter his opinion if he paid a visit to Mr. Borgas' homestead. Three acres had been put in with the drill with manure at the rate of 40lbs. per acre, and two acres at 80lbs. per acre. The latter would give 4bush. more than the unmanured, while the former was also considerably improved. Those who saw the plots were convinced that it would pay to use the drill. In addition to experimenting with manures Mr. Borgas was testing fifteen varieties of wheat side by side, and a better lesson on the necessity for selecting wheat specially suitable for the district could not be wanted. Four of these wheats were greatly superior to the others, and well worth more attention. The residents were greatly indebted to Mr. Borgas for the work he was doing. Mr. Wardell thought the seed should be drilled in, but questioned whether it would pay to use manure in this district, owing to the extra expense and the precarious rainfall. The Chairman stated that good sheep manure would pay to use. He was greatly in favor of the drill, which placed the seed in the hollows and left the weeds on the ridges. This enabled them to run light harrows over the land after rain to destroy the weeds without injuring the wheat. A vote being taken, members with the exception of Mr. Laidlaw favored the use of the drill. A vote of thanks was accorded to Mr. Borgas for his work in carrying out these experiments.

Port Pirie, October 14.

Present—Messrs. E. J. Hector (in chair), F. Humphries, W. Smith, H. B. Welch, G. M. Wright, T. Jose, T. Gambrell, J. Lawrie, and R. J. Ferry (Hon. Sec.).

Weed.—Mr. Humphries reported that the very objectionable weed known as "three-cornered Jack" (Emex Australis) was spreading rapidly in the district. It was useless for fodder, except when very young, while the seeds in the hay rendered it unpleasant to handle and also crippled the young lambs. Members wished to know whether the weed had been proclaimed as a noxious weed, and if not, requested the Central Bureau to urge the Government to have it so proclaimed. [This weed is not under the Noxious Weeds Act, and as it covers considerable areas in various parts of the colony, often sandy lands too poor to pay to clear, it would be useless under the present law to ask that the weed should be proclaimed. Before this can be proclaimed a noxious weed a resolution must be passed by both Houses of Parliament requesting that such should be done, and the proclamation, if issued, would apply to the whole colony. The Central Bureau has frequently urged the Government to so amend the law as to permit of weeds being proclaimed noxious in particular districts upon the request of the local authorities, and until this is done it is simply useless to ask that any more weeds be added to the list.—Gen. Sec.].

Carriage of Stock.—It was decided to endeavor to get the railway authorities to put on a truck once a week to carry pigs and calves to Adelaide at a lower rate per head than at present charged.

Co-operation.—This subject was discussed, and the South Australian Farmers' Union came in for strong support, several members pointing out the advantages they had derived as members of the union.

Watervale, October 16.

Present—Messrs. C. A. Sobels (Chairman), H. Scovell, S. Solly, R. Perrin, W. Smith, L. Buring, and E. Treloar (Hon. Sec.).

Stock Complaints.—The Hon. Secretary reported that one of his cows had warts on the teats, and he wished to know how to get rid of them. Several members suggested the use of castor oil. Mr. Solly inquired *re* treatment for snake-bite. One of his horses had died apparently from the effects of snake-bite. The Chairman recommended ammonia and brandy. He gave about three-quarters of a bottle of brandy and ammonia to a pony suffering from snake-bite with good results. Several members also recommended this treatment.

Fruit Tree Diseases.—Two members reported existence of what was apparently a new disease in the late peaches. The tops of the trees appear perfectly healthy, but all the leaves on the lower branches appear as if burnt. The fruit does not seem to be affected, and the trees improve in condition later on though there remained a gumminess about the affected parts. Curl-leaf was reported to be very prevalent this year. Red spider was also doing a lot of damage, and was more prevalent than noticed in any previous year. Members wished to know if there were more than the one species of red spider. Frost has done very serious damage to the orchards and vineyards. [Probably the loss of leaves on peach trees was caused by ground frost, which did not reach sufficiently high to injure the upper parts of the trees. There is more than one species of Tetranychus, but the species called Tetranychus tellurius is known commonly as "red spider." The remedy at present is flowers of sulphur, but the cure is sulphur, lime, and salt applied in winter.—Gen. Sec.]

Johnsburg, October 14.

Present—Messrs. F. W. Hombsch (Chairman), G. H. Dunn, H. Arnold, T. A. Thomas, T. Thomas, L. Chalmers, J. Sparks, P. Caughlin, and T. Johnson (Hon. Sec.).

Congress.—Delegates reported on their attendance at the Congress of the Agricultural Bureau, and their visits to the Agricultural College and the Produce Export Depôt. They were well pleased, but suggested one or two items which might make things still more pleasant for visitors.

Locusts.—Mr. T. A. Thomas said he had tried poisoning with arsenic and sugar, whilst the locusts were without wings, but the mixture dried quickly on the herbage, and the locusts would not touch it. The locusts are very abundant in the district, and have considerably damaged the late wheat, besides denuding some paddocks of feed.

Rabbit Extermination.—Mr. Dunn read a paper. The following is an abstract:—

He had been located where and when rabbits first became a nuisance, and had been amongst them ever since. At first poison was not thought of, and the rabbits had to be dug out with much labor. Finding that there was a market for living rabbits he adopted a plan of catching them alive. He made a number of square wooden shoots or tubes, about 18in. long and 4in. clear inside. Near one end he fixed an easily lifting swing-door made with three light wires fastened to a light piece of wood of the right length to fit inside the chute, and pivoted near top of chute, the wires being long enough to lie at an angle of 45° when closed. He placed one of these in the mouth of each main burrow and packed the earth around it, then enclosed the whole set of burrows with rabbit-proof hurdles. The rabbits would come out during the night, and not being able to get back into the burrows would be nicely yarded next morning. Many people are now using the wire cylinder traps described and illustrated in the *Journal of Agriculture and Industry* for December, 1898. These are very successful, but might be improved by making the portion which goes into the burrow of wood, and having the trap-door in this, but affixing the wire cylinder to the other end. This would be much more easily worked and handled than the vermin-proof hurdles, and the wooden chute would prevent any earth falling in and stopping the action of the swinging gate or door. When neither skins nor carcasses are of value there is nothing better for destroying rabbits than wholesale poisoning. They can be poisoned even in the burrows by digging out the entrance till it runs a foot or more underground. Poison a good handful of sandalwood leaves, nice green saltbush, or other attractive food; place this about a foot into the burrow, and fill the remaining part with fine earth, leaving it as loose as possible. The rabbits eat the bait and die, and the stench is so bad for a time that other rabbits do not care to take up their abode there.

Mount Bryan East, October 21.

Present—Messrs. E. T. Prior (in chair), A. Pohlner, T. Best, J. Prior, H. Wilkins, and W. Dare (Hon. Sec.).

ALGERIAN OATS.—Mr. Wilkins tabled sample of Algerian oats 4ft. high. Members wished to know whether these oats will stand cutting more than once as green feed. Mr. Wilkins also showed skinless barley and Bartlett's Crossbred wheat. The heads of the latter were only about half as long as those of Purple Straw wheat. Members were of opinion that New Zealand Red Straw and Purple Straw were the best wheats for this district.

CONGRESS.—Delegates reported on proceedings of Congress, and a lengthy conversational discussion ensued.

Riverton, October 21.

Present—Messrs. H. A. Davis (Chairman), W. Hannaford, D. Kirk, T. Gravestock, M. Badman, M. Nash, F. M. Calf, and H. A. Hussey (Hon. Sec.).

INSPECTION OF ORCHARDS AND CROPS.—It was decided to arrange for an inspection of the crops and orchards by the Hon. the Minister for Agriculture.

ATTENDANCE.—The Hon. Secretary called attention to the apathy of certain members. It was not fair to expect all the benefits as members and not to attend the meetings. It was resolved to notify the absentees that the rule *re* non-attendance will be strictly enforced in future. The Chairman thought the meetings would be more interesting if the *Journal of Agriculture* was studied more and items of special interest noted. Members might also do good by lending their *Journals* occasionally to their neighbors.

Lipson, October 14.

Present—Messrs. S. F. Potter (Chairman), G. Provis, C. Provis, Jas. Brown, E. J. Barraud (Hon. Sec.), and one visitor.

ENSILAGE.—Mr. G. Provis stated that in response to his inquiry at last meeting for information on this subject, he received from the Central Bureau a leaflet giving the desired information. He had constructed an ensilage pit in accordance with the instructions received, and would report on the result later on.

BEST WHEATS.—Discussion ensued on the best wheats for this district; Steinwedel was favored as an early variety, and Purple Straw as a late one. The Hon. Secretary thought that where the crop was drilled in a dry district together with fertilisers it was safest to put in an early variety.

MAKING FARM LIFE ATTRACTIVE.—A discussion took place on how to beautify the home and make farm life attractive. The Chairman advised the bachelor members that the first and most important step was to secure a suitable partner for life.

SMUT.—Mr. C. Provis said portion of his oat crop sown without pickling was showing signs of smut, but that pickled was quite free.

Arthurton, October 19.

Present—Messrs. W. Short (Chairman), T. B. Wicks, J. Koch, W. H. Hawke, C. L. Palm, J. B. Rowe (Hon. Sec.), R. A. Montgomery (Chairman, Dowlingville Branch), and three visitors.

BRANCH CONFERENCE.—Delegates were appointed to attend Conference of Northern Yorke's Peninsula Branches to be held at Bute in February.

FIELD TRIAL SOCIAL. — Considerable business in connection with the Northern Yorke's Peninsula Bureau Field Trial Society was transacted. The Chairman thought a mistake had been made in not putting in the conditions in the clause providing that no help be allowed after starting the binders and mowers, but Mr. Hawke said it was a step in the right direction, as it gave those in charge of the machines the opportunity of getting the best work out of the machine. It was decided to support the efforts being made to secure land at Bute for the society, instead of at Paskeville. It was also decided, on the motion of the Hon. Secretary, to suggest that in order that the land treated at the ploughing trials may be available for sowing without reworking the ploughing should be done in a similar way to ordinary farm work, and not cut up into so many small pieces; that the ground be all cut when striking out, each man to back up his first strike out by one width of plough, and that to be his ridge.

HAY.—Mr. Hawke called attention to recommendation in October issue of the *Journal of Agriculture* by the General Secretary to cut hay crops when the grain begins to harden. He had previously advised cutting when in full bloom, and members wished to know reason for this sudden change of opinion. Members consider that for chaff the hay is best cut when the grain is just beginning to harden, but as hay stock prefer it cut in full bloom or as the bloom was falling. [Because Professor Lowrie recommends it, and he is good enough authority. —GEN. SEC.].

BLUESTONE.—Mr. Montgomery thought that it would be a good thing to bring bluestone under the Fertilisers Act in order to prevent the sale of inferior stuff. Members agreed to support the Dowlingville Branch in their efforts to get the Department to undertake analysis of bluestone.

RAINFALL.—At Winulta, for October, 0·52in.; at Arthurton, 0·25in.

Mylor, October 28.

Present—Messrs. W. Nicholls (Chairman), P. P. Probert, W. H. Hughes, R. Rosser, T. J. Mundy, F. G. Wilson, E. Wilson, W. G. Narroway, J. Nicholls, R. Russell, W. G. Clough (Hon. Sec.), and twenty-two visitors.

DAIRYING.—On September 30 Mr. G. S. Thomson, Dairy Instructor, gave an interesting address on this subject with special reference to treatment of milk, &c., under conditions existing on small blocks.

CO-OPERATION.—Messrs. C. Ricks and G. A. Dunn, directors of the South Australian Fruit and Vegetable Co-operative Company, explained the objects and proposed business of the co-operation, and answered numerous questions concerning the same.

Stockport, October 17.

Present—Messrs. G. D. Stribling (Chairman), C. W. Smith, T. Howard, J. Smith, J. Smith, jun., J. F. Godfree, P. Hogan, and J. Murray (Hon. Sec.).

SOCIAL MEETING.—Hon. Secretary reported that a very successful social meeting was held at Mr. S. Smith's homestead on September 19, attended by members of the Branch and over 100 visitors. During the afternoon cricket, tennis, croquet, and other games were indulged in, with dinner and tea on the field. In the evening singing, dancing, and various parlor games passed the time most pleasantly. Thanks to Mr. J. Smith for his entertainment and to Mr. Godfree for loan of piano.

Congress, &c.—The delegates reported on their attendance at Congress. Mr. C. W. Smith reported on machinery at the Adelaide Show; Mr. Godfree on horse stock; Mr. J. Smith on cattle, sheep, pigs, &c.

Forster, October 24.

Present—Messrs. J. Retallack (Chairman), A. G. Prosser, C. R. A. Schenscher, J. A. C. Schrenscher, J. D. Prosser (Hon. Sec.), and three visitors.

Black Rust.—Some members expressed their opinion with respect to the origin of black rust (Urocystus oculta), which is propagated from spores (or seeds) just as other plants, parasitic or otherwise, are propagated.

Three Best Wheats for District.—Members consider Dart's Imperial or Rattling Jack best for earliest sowing, Red Straw next, and Early Para for late sowing.

Feed for Horses.—Members are of opinion that short feed is best for horses in this district. Mr. Prosser thought some farmers tried to get two days' work out of their horses in one day, and did not give them enough to eat. All farmers should chaff their hay, as 10 tons of chaffed hay is as good as 12 tons of long hay. If a farmer cannot give his horses all chaffed hay he could mix it with wheat chaff, boiled wheat and pollard, or bran. Give short feed always during ploughing season, so that the horses will have the best part of the night for rest. Long hay occupies most of their time at night to eat it, and they waste a deal. Horses should not start ploughing until 8 o'clock a.m., and should have one and a quarter hours for dinner and watering. They will then keep in good condition, and the farmer will get his work done just as soon as if he worked from daylight till dark.

Balaklava, October 14.

Present—Messrs. P. Anderson, C. L. Reuter, W. H. Sires, A. Manley, A. W. Robinson, J. Vivian, E. Roberts, G. Reid, and four visitors.

Congress.—Mr. Anderson reported on proceedings of Annual Congress and on visit to the Produce Depôt.

Visit to Homestead.—This meeting was held at the farm of Mr. A. W. Robinson. The commodious stables, method of watering stock, shelters for stock in the open paddocks, &c., came in for a good deal of attention. The manured crops were carefully inspected. Crops manured with ½cwt. English super. per acre were better than those receiving twice that quantity of super. guano. Members were unanimous respecting the superiority of English super. over all other manures tried in this district.

Gawler River, October 20.

Present — Messrs. J. Badman (in chair), J. Drinkwater, H. Heaslip, J. Barritt, T. P. Parker, H. Hillier, C. Leak, D. Humphries, H. Roediger (Hon. Sec.), and one visitor.

Mangolds for Pigs.—Mr. Parker stated that he found his pigs did well on both tops and roots of mangolds, and was convinced it would pay well to grow a few for the pigs.

Fertilisers.—A discussion on the use of fertilisers took place. Mr. Parker stated that on some poor land he had put some of the Sugar Refinery Co.'s super., and the crop was much superior to the unmanured crop alongside; about 100lbs. per acre was sufficient. The Hon. Secretary had good results from use of the same manure at the rate of 1cwt. per acre, but a mixture of the super. and bonedust, half and half, gave even better promise. Most of the members considered bonedust the best manure to use, as it was more lasting. Several members had good results from Kangaroo brand guano.

Dowlingville, October 20.

Present—Messrs. R. A. Montgomery (Chairman), J. Phelps, T. Illman, T. Lombladt, J. Kenny, G. Mason, R. Foggo, J. Birkin, H. Crowell, G. Inkster, W. T. Holland.

Bluestone.—Members are of the opinion that bluestone should only be sold with a guarantee of its strength. At present a farmer may be using bluestone with but low percentage, and thus making the pickle too weak; or they may get bluestone of much greater purity, and make too strong a pickle. The Branch would like other Branches to consider whether bluestone should be brought under an Act similarly to fertilisers.

Brinkworth, October 19.

Present—Messrs. G. Freebairn (Chairman), G. Wooldridge, C. A. Horne, A. L. McEwin, A. W. Morrison, J. Graham, R. Cooper, W. H. Pearce, and J. Stott (Hon. Sec.).

Homestead Meeting.—This meeting was held at Mr. W. Freebairn's farm, where the members inspected several plots of wheat, and were much pleased with a plot of Petatz Surprise. Mr. Freebairn has various devices for raising water, some of them simple and cheap. Some very good pigs, of various breeds, are kept, and the cattle are of good quality. Labor-saving contrivances of many kinds are employed. After inspection of these interesting items on a well-managed farm the members sat down to tea, and animated conversation took place afterwards, ended with thanks to host and hostess.

Question. – A question was discussed and left for future consideration as to whether it is better to cut a 20bush. crop of wheat for hay or to let it ripen, reap it, and feed wheaten chaff and wheat.

Appila-Yarrowie, October 13.

Present—Messrs. P. Lawson (in chair), J. Fuller, A. Fox. J. M. Grant, J. H. Bottrall, W. Stacey, J. O'Connell, J. Daly, H. Klemm, E. Catford, and C. G. F. Bauer (Hon. Sec.).

Congress, &c.—Delegates reported upon their visits to Congress, Produce Depôt, and Agricultural College. They were particularly well pleased with everything, but considered that there were far too many persons allowed to visit the Agricultural College at one time. Some educational plots were ruthlessly trodden down by visitors, despite the warnings and efforts of the Professor of Agriculture and his assistants. A large number of the visitors make it a rule to attend every year, and thus deprive others of the privilege.

Noxious Weeds.—Members decided to direct the special attention of the district council to the rapid spread of noxious weeds in the district.

Paper.—Mr. W. Stacey read the following:—

THE FARM AND HOMESTEAD—HOW A FARM SHOULD BE SELECTED, CULTIVATED, AND MAINTAINED AND A HOMESTEAD ESTABLISHED.

Selection.—The selection of a farm must be governed in a great measure by the depth of the purchaser's pocket. A very suitable selection, or "second hand" farm may be available, but its size, price, and the conditions of its purchase may place it quite beyond the buyer's reach; and he may thus be forced to accept a farm of inferior quality, further perhaps from market and in a less favored locality. In any case I would avoid being burdened with heavy interest. If, however, I were forced to accept this inevitable portion of the "white man's burden," I would prefer paying it on a small farm of good quality rather than upon more broad acres of inferior land, or in a precarious or uncertain district.

The Homestead.—The site of the homestead should in all cases be fixed as near as possible to the centre of the farm for convenience of working; but a more important consideration still is the location of water, and where running or spring water is obtainable the homestead should be in close proximity, and where possible upon rising or sloping ground, so as to admit of natural and effectual drainage. In determining upon a dwelling many examples are to be seen, from a palace on the one extreme to almost a pigstye on the other; and while I consider a man with his family should not huddle themselves up in a hovel, I am equally against erecting a grand residence, very much more than is required to comfortably house those engaged upon the farm, and very often at the expense of machinery exposed to the sun's rays and the stock of the farm to the winter's blast. The outbuildings should be strong, substantial, and lofty. Of course, whether of stone or wood depends upon which can be procured and erected at the most reasonable cost, having always due regard to the fact that stone (unlike wood) will never rot, neither will it burn. For warmth in winter, however, and moderate temperature in summer, commend me to stone stables with straw roof. I believe in feeding the horses from the front of the manger, and to facilitate this the stackyard and chaffcutter should be arranged adjacent thereto. All the implements of the farm should be kept under cover, and it is needless to mention should be cleaned and oiled when put away. Fowls of every variety are always an excellent commodity on the farm, but it must be remembered that the implement shed should not be turned into a fowl roost, as we so often see to be the case. The pigstye should be large and roomy, with the floors of concrete or slab, well sloped and drained.

Fences.—These should certainly be substantial from the first, split posts, and, if timber is not too dear, I would recommend 9ft. panels. Avoid round posts. My experience has been that a good fence for all kinds of stock is as follows:—Five wires, with barb let in with saw-cut 3in. down centre of posts. Never use barb wire for gates, as we frequently see on many farms. If you cannot afford an iron gate, a few shillings will purchase sufficient timber; a couple of hours will make one. Good fences make good cattle, and bad fences bad cattle. The paddocks should be divided into convenient sizes for working, if possible sheep proofed, and a few sheep always kept on the farm. A few dairy cows should be a portion of the stock of every farm. Keep no more horses than are actually required for working the farm. Feed such horses well and regularly, and they will do their work well.

All Stock on the farm should be of the best obtainable quality, as a good animal costs no more to keep than a weed (very often less), and, of course, give a greater return, either in produce or work.

Cultivation.—This is an important factor towards all successful farming. All the land should be worked well and in due season. Wherever possible crop only from fallow, which should be begun early and finished in due time. The advantage gained over late fallow more than counterbalances any temporary loss of feed occasioned thereby. Fallow should then be well worked up to hay time if suitable spring rains fall. If, however, the ground remains dry, it is useless to expend labor and time in disturbing it. Feed down well with sheep and keep clean. Seed-time and harvest should be commenced early to enable the work being done in due season. Shade for stock is a most necessary provision. Summer shelter should be provided on the flat and treeless country by planting the corners of the paddocks with, say, sugar gums or pepper trees, which also afford shelter to the inclement weather and storms of winter.

Burra, October 27.

Present—Messrs. F. A. S. Field (Chairman), Jas. Scott, E. Goodridge, F. A. Arnold, F. Duldig, and R. M. Harvey (Hon. Sec.).

Grasshoppers.—Members reported that grasshoppers have ruined some of the wheat crops in the district.

Rabbits.—The rabbits have done much damage towards the east of the Burra, although they were very scarce during the dry season; where the feed is good they have reappeared. Members considered that united action amongst the landowners to exterminate the rabbits is necessary, as it is feared that they will be a great nuisance again.

Peach Aphis.—Mr. Arnold wished to know the best way to destroy aphis on his peach trees. The trees are in full leaf, and he had sprayed them with a weak solution of tobacco, but with only temporary results. [Fumigation with tobacco smoke, or spraying several times with strong tobacco solution at intervals of three or four days will get rid of the pest.—Gen. Sec.]

Arden Vale, October 16.

Present—Messrs. A. Hannemann (Chairman), C. Pearce, M. Searle, A. W. Fricker, P. Starr, F. Schuttloffel, O. Liebich, G. H. Williss, L. Warren, G. Miller, and E. H. Warren (Hon. Sec.).

Homestead Meeting.—This meeting took place at Mr. M. Searle's farm, where members inspected nine experimental plots of wheat, including a new variety, "Sullivan's," which is reported to have yielded 60bush. per acre in New South Wales, but is not here considered any better than King's Solid Straw. Full particulars of yield of each variety will be furnished later on. Fruit trees were very heavily laden, especially apricots and peaches, but the fruit on one apricot was wholly destroyed by frost. Refreshments were provided and host and hostess thanked. The usual annual social took place in the evening, and an excellent and varied programme was executed by local talent.

Drilled Manures.—The Hon. Secretary reported that plot of wheat drilled in with American super. by Mr. Noll, of Quorn, was decidedly better than that left untreated.

Port Elliot, October 28.

Present—Messrs. P. O. Hutchinson (Chairman), H. Green, sen., H. Pannell, W. H. Hargreaves, J. Nosworthy, J. R. Coote, J. Brown, and J. Davidson.

Bull.—This Branch safely received bull loaned by the Department of Agriculture.

Lice on Pigs.—Mr. Brown recommends kerosene wash as an effectual remedy for lice or ticks on pigs.

Exhibit.—The Chairman tabled samples of crested dog's tail grass grown from seed sent out by the Central Bureau.

Horticulture in Stringybark Country.—Mr. W. E. Hargreaves read an interesting paper on "Growing of Fruit Trees, &c., on Stringybark Country in the Hills." The following is the cream of it:—

> When starting to grow fruit trees in gum and stringybark gullies it is a great mistake to dig holes amongst the stumps and scrub and stick the trees in them. It will pay far better to thoroughly clear land enough for fifty to 100 trees, plough the whole at least 6in. deep, dig holes 4ft. x 4ft. x 2½ft. deep, break up the bottom soil, fill up with surface soil only, and plant the trees properly. The square system is preferable. First put in pegs or stakes where the trees are to stand, see that they are regularly placed, then plant the best trees of each sort—one where each peg or stake is placed. Too much or too frequent cultivation cannot be given to fruit trees or vegetables, and the Planet Junior implements appear to be the best suited for this purpose. A good cross-cultivation is as good as half an inch of rain. Never buy trees at auction, but go straight to an honest nurseryman, get the best he has, and pay a fair price for them. These trees will grow more in one year than the others would in three, and finally produce good marketable fruit in place of the rubbishy stuff obtained from auctioned trees. Very often the land is blamed for failures caused through sticking any sort of rubbish in small holes dug in the original scrub land, just watered once or twice, and left alone until the time

when fruit might have been hoped for were the land properly prepared, best trees properly planted, cultivated, and cared for. Some men were born tired, and continue tired all their lives; but seem to expect as much success as falls to the lot of the hard-working, intelligent, and thrifty cultivator of the soil. There are hundreds of acres amongst the hills that are unsuitable for wheat-growing, but well adapted for fruit. But the soil must be properly cleared and ploughed; the trees must be selected to produce the best quality of fruit; they must also be carefully planted, cultivated, and treated, and then very large quantities of excellent fruit for export will be produced on land which at present grows nothing but useless scrub. This would give profitable employment to many hundreds of men.

Swan Reach, October 28.

Present—Messrs. J. O. J. Kohnke (Chairman), P. A. Hasse, F. Fischer, F. F. Brecht, P. A. Beck, G. Grieger, E. Micke, and O. Halliger.

Branch Show.—Accounts in connection with River Branches Show, at Swan Reach, in September, showed satisfactory result.

Officers.—Mr. P. A. Beck tendered his resignation as Hon. Secretary, and was thanked for his services since the inception of the Branch. Mr. O. Halliger was elected Hon. Secretary. It was decided that each member should take it in turn to read a paper or initiate a discussion on some practical subject.

Export of Lambs.—The Chairman stated he had some difficulty in obtaining a fair price for his lambs as the Export Depôt could not deal with those he had for disposal. The middleman made use of the depôt to the exclusion of the producer, and secured a profit of 80 per cent. and more. Members thought more accommodation should be provided to deal with all the lambs offering.

Co-operation.—This subject was discussed and the Farmers' Unions' claims for the support of the farmers strongly advocated.

Elbow Hill, October 24.

Present—Messrs. H. T. Styles (Chairman), C. G. Ward, E. Wake, W. N. Beinke, J. Harvey, H. Dunn, G. Wheeler (Hon. Sec.), and six visitors.

Congress.—Mr. Wake gave an interesting report on proceedings of Congress, and on the visit to the Roseworthy College. He thought the work done by Professor Lowrie was not only a splendid object lesson to farmers, but also of material and lasting benefit to the whole farming community. Mr. Wake also stated that in reply to his inquiry Mr. W. Hackett recommended Beauty of Hebron, White Elephant, Early Rose, and Regent potatoes for this district.

Boothby, October 26.

Present—Messrs. J. T. Whyte (Chairman), G. T. Way, J. R. Way, T. Sims, J. A. Foulds, J. Bell, R. Carn, A. Robb, H. G. Evans, M. Leonard, R. M. B. Whyte (Hon. Sec.), and eight visitors.

Harrowing.—Mr. Foulds favored leaf harrows. The only fault he had to find was that they were too weak in the eyes where the tines fitted in. This he thought could easily be overcome. Other members favored hinge harrows as doing the best work.

Manuring.—The Chairman read report on results of manuring experiments at the Roseworthy College. Mr. Swaffer stated that at Tumby Lawes' super. was giving the best results.

Fallowing.—A discussion took place on this subject. Mr. Foulds found fallowing the pine land beneficial, but on mallee or teatree land he could not see that any improvement resulted from the operation. Mr. Sims said he gave up fallowing mallee land as no benefit resulted. Mr. Turnbull's experience was similar. Mr. Ashford said in his part of the district fallowing was always a success.

Homestead Meeting.—This meeting was held at the homestead of Mr. H. G. Evans, and after the business of the Bureau was completed a social evening was spent. About ninety persons were present, and the gathering was a great success.

Renmark, October 19.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, R. Kelly, T. Rogers, E. E. Hutton, R. V. Bostock, H. Swiney, and E. E. Taylor (Hon. Sec.).

Experimental Orchard.—Mr. Waters initiated a discussion on the establishment of an experimental orchard at Renmark. Members generally did not favor the suggestion, being of opinion that it would be better for individual growers to carry out manurial and other experiments on their own land.

Currant-growing.—A long discussion ensued on paper read at Congress by Mr. Thos. Hardy, and it was agreed that the paper contained many points of interest to currant-growers in this district.

Albert, October 7.

Present—Messrs. J. Wetherall (Chairman), C. Setterby, W. Farley, A. Norton, W. Freer, R. C. Rasmussen, G. Holmes, and H. L. Smith (Hon. Sec.).

Lice on Pigs.—Mr. Holmes inquired treatment for pigs infested with lice. The Chairman found the application of kerosine and salad oil effectual.

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NOTES AND COMMENTS.

The weather during the past month has been of an unusual character for November. Cool showery weather has alternated with pleasant warm days. Reaping operations with the early crops have been considerably delayed, but little if any loss has resulted, owing to the absence of strong winds. The later crops have benefited very considerably from the cool weather. Hay-making is nearly finished in all but the latest districts, but the yield in most cases has not been satisfactory. Considerable difference of opinion exists as to the probable grain yield, but the estimates generally range from 5bush. to 6bush. per acre. The warm moist weather has been distinctly favorable to the spread of fungus diseases amongst fruit trees. Peach curl-leaf has been very prevalent, while it is reported from some quarters that apple scab is badly affecting the trees.

On the 28th November the Central Committee of the Drought-Distressed Farmers' Fund met to consider report on Mr. A. Melrose's suggestion that the balance of funds in hand should be set apart to form the nucleus of a permanent fund to be called the "Farmers' National Fund," to which subscriptions in kind or money be invited from the farming community, with a view to the establishment of a substantial fund from which assistance could be granted to subscribers in case of necessity. The Committee, after considerable discussion, decided against the proposal, and it was resolved that the finance committee be empowered to invest the assets of the fund in such manner as they may think best until it is deemed advisable to resume relief operations.

For several years past Mr. Marshall, of Wasleys, has been putting in his crops in the ordinary way with the seed and fertiliser drill, but finds this method too slow for the strength of teams required, especially in the heavier land, when wet weather comes, where two teams of four horses each are required daily for each 13in. coulter drill. With the two drills at work, sixteen horses are required to put in about thirty acres per day. He has therefore adopted the practice of putting in part of the manure, by means of the drill, between harvest and seed time. This can be done with a smaller team than later on, and also gives the land another working. Then in April or May the seed is sown on the surface by means of the broad-cast seed-sower, only two horses being required, and covered by means of a scarifier. By this means seeding is greatly facilitated, and 800 acres can be put in in four weeks, and the results have been quite equal to where the seed and manure are put in together. This practice can of course only be followed satisfactorily on clean fallow land, but Mr. Marshall has made it a practice to sow nothing but fallow, and to work the fallow well, the result being that there are few weeds of any description in the crops. The same system of applying the manure has been adopted by a number of farmers in the colony and appears to give satisfactory results. With the slower-acting manures, such as bonedust, guano, and Thomas phosphate, it is very probable that better results would be obtained on clean land, by putting in the manure as soon after fallowing as possible, than by putting in the seed and manure together.

During the past month two or three special instances of the value of Bordeaux mixture as a preventive of peach curl-leaf have come under notice. In one case through accident, and in another intentionally, portions only of the trees were sprayed when the buds were starting to swell. In both cases the unsprayed branches have been seriously affected by the disease, while the parts sprayed have escaped injury.

It is very handy for the farmer's wife to have vegetables brought to the door, but she must purchase the stuff that is brought, or go without. Stale vegetables, that have been away from the garden perhaps several days, handled and picked over by numerous other customers, are not likely to be as clean and nice as those grown on the farm, and have to be paid for in hard cash. Where market gardens are in close proximity, there is not so much reason for farmers undertaking the growing of vegetables and fruits; but stale stuff that has been grown perhaps a hundred miles away, and has passed through the hands of half a dozen middlemen, can never be cheap, although it is almost sure to be nasty.

Mature, full-bearing apricot, peach, nectarine, apple, and pear trees ought not to be allowed to carry more than one fruit to each 4in. of limb, or about one to each square foot of surface. If allowed to stand more closely the fruit will be small. This will often necessitate removal of half to three-fourths of the fruit that has set; but when gathered the remaining fruit will weigh more and fill more baskets than would have been obtained without thinning. The value of the smaller number of large fruits will be very much greater than that of the small rubbish, and the vital forces of the tree will have been subjected to a much lesser strain.

Considerable numbers of apricot trees have suffered from some trouble known generally as "die-back," variously attributed to dry season, poverty and unsuitability of soil, &c. Mr. E. M. Sage, of Pinery, whose trees were affected, cut a number back two years ago, and treated some of them to a good dressing of phosphates. He reports that these latter are making splendid growth this season, but those headed back and not manured are either making very little growth or have died out completely, and expresses the opinion that a heavy manuring with soluble phosphates will go a long way towards stopping or curing the complaint.

During the past few years some interesting experiments have been carried out by the New York Agricultural Experiment Station in regard to the self-fertility of the grape vine: 169 cultivated varieties—American and hybrids between American and European species—were tested, and of these, 103 produced marketable clusters when the blossoms were covered to prevent pollenation from outside sources. Of these, however, only thirty-eight produced perfect to somewhat loose clusters of fruit; the others, though marketable, being rather loose. It was noticed that all the self-fertile varieties bore flowers with long stamens. but some of the self-sterile kinds also had long stamens. It is considered that the most satisfactory explanation of the self-sterility of the various species appears to be that there is a lack of affinity between the pollen and the pistils of the same variety. The fact of a number of the self-sterile varieties being hybrids may also explain to some extent this result. None of the varieties usually grown in South Australia were included in the tests, but the results suggest the advisableness of ascertaining to what extent our grapes are self-fertile or otherwise.

Apples which had been wrapped in tissue paper and then packed in floury asbestos have been received from Victoria by a fruit salesman in Covent Garden, London, in perfect condition. The cases were carried in the hold of the s.s. *Wakool* as ordinary cargo. Freight was 6d. per case, instead of 3s. 9d. by refrigerator. The asbestos is saleable in London; and if this method of sending fruit can be adopted on a large scale it will prove to be enormously profitable to Australasian fruitgrowers. [Editor suggests that a trial should be made with infusorial earth, which is an excellent insulator.]

Mr. G. R. Laffer, of Belair, brought to this office samples of three newly-introduced strawberries, which prove to be of the highest quality. Royal Sovereign is of extra large size, excellent flavor, medium color, fragrant, and a good yielder. Arthur and Sharples are very handsome, well-shaped, brighly-colored fruits of exquisite flavor. These three are decidedly an acquisition to be prized by our strawberry-growers.

Preservation of natural fruit juices is an easy matter, but requires strict attention to details. First press out the juice, strain it through flannel bags or filters, place the filtered liquor in clean bottles or other vessels that can be effectually sealed, then put these up to within 2in. of the top in a tank of water; bring the temperature up to 180° F., and keep it at that for ten minutes. Finally cork and seal the bottles, &c. If the temperature is allowed to rise above 200° F. the juice will have a cooked flavor; if kept under 170° F. the germs of ferments may not be killed, and the liquor will ferment and probably spoil.

Nearly all birds living in the fields and forests eat insects. During the year they consume tons upon tons of caterpillars, moths, grubs, beetles, worms, maggots, and other agronomical pests, which otherwise would devastate our fields, orchards, and gardens. The larger the bird the more beneficial it is; but the small birds usually attack the small pests, especially amongst our garden and orchard crops. Locusts are eaten chiefly by crows, stone plovers (so-called "curlews"), magpies, larks, common plovers (sometimes called "lapwings"), and many other field birds. Waterfowl are omnivorous, eating water weeds, grasses, frogs, fish, crabs, shrimps, and other crustaceans. These latter birds should be absolutely protected from June 30 to November 30, and all other birds, except sparrows and starlings, should be protected from January 1 to December 31.

Wherever a farmer or gardener is found to be in prosperous circumstances, it will be noticed that he has something coming in and something to sell nearly all the year round. There are localities where the chances for production are greatly limited, but even there it will be seen that the cultivators in some cases deal only with wheat, hay, and perhaps barley and oats, whilst others will have eggs, poultry, bacon, butter, fruit, vegetables, lambs, and many other items bringing in cash. The numerous small items make a respectable total by the end of the year, in addition to the income from cereals and hay.

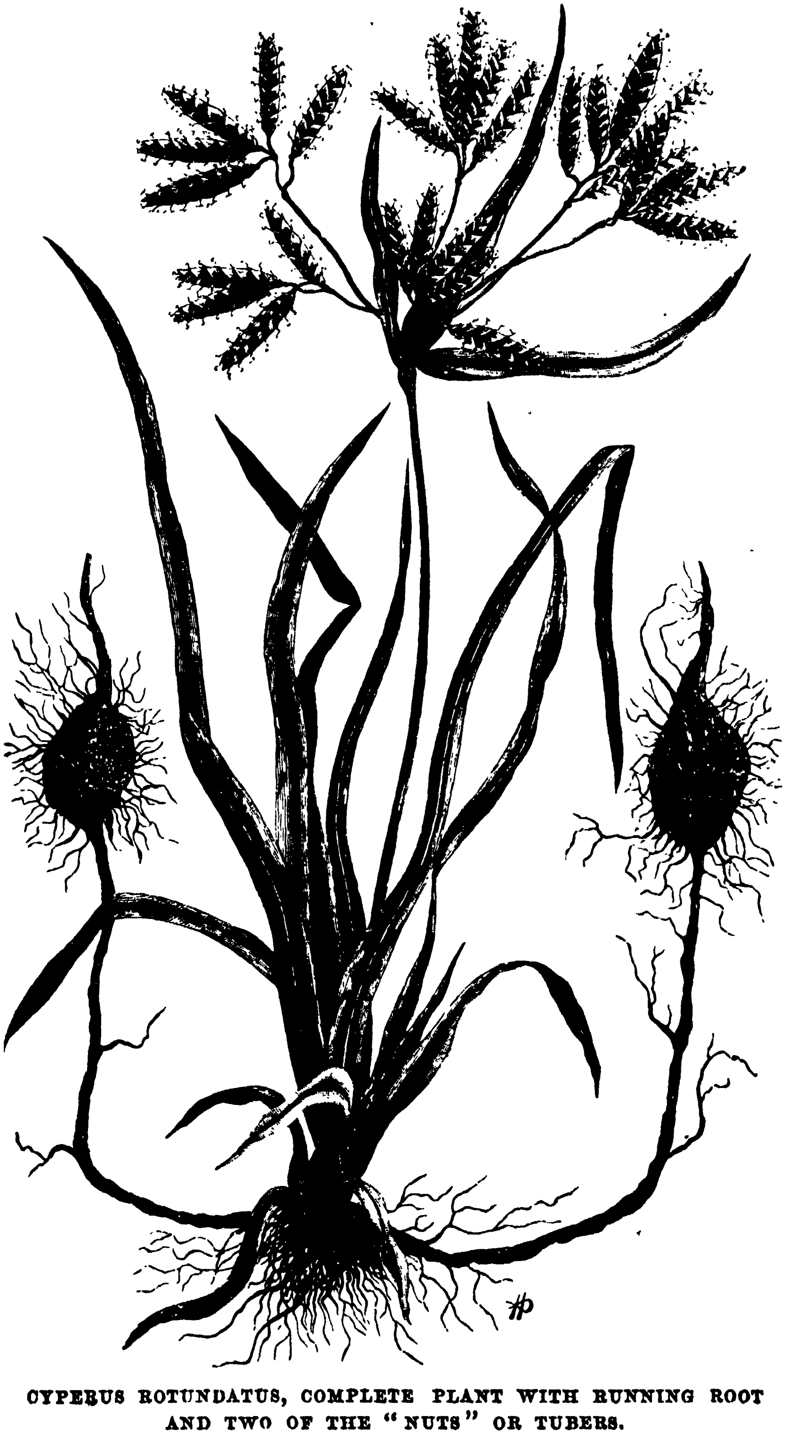
The Belgian hare (really a rabbit) weighs about 8lbs. when dressed. Quite a "boom" in breeding these has broken out in the United States. As much as 250 dollars have been paid for a single buck and 150 dollars for a doe. These rabbits are quite as prolific as the common sort.

In Spain, Morocco, and similar warm climates the prickly pears are commonly sold in the streets, after being peeled to obviate the danger from thorns. These fruits are especially grateful and refreshing when a good variety is secured. There are thornless varieties of "prickly pears," or "Indian figs," as they are often called. Professor Emory E. Smith, of Palo Alto, California, has lately fruited seven varieties of these, secured in Malaga, Palermo, Algeria, and Morocco. They are of great size, some fully 4in. long and 2½in. diameter, and in colors varying from deep ruby to dark yellow. They are quite delicious as a table fruit, and make a splendid jelly of most attractive color. This fruit will thrive without irrigation on sandy land in the most arid parts of these colonies.

Throughout the Australasian colonies there is a complaint that too many petty "agricultural" shows are held. The evil effects are wide-spreading. Necessarily small prizes limit competition to inferior exhibits, especially of live stock; inferior stud animals are awarded prizes which lead to perpetuation of inferiority in their progeny, through being employed by breeders who are misled by the awards of supposedly specially-qualified judges. Importers and manufacturers of agricultural implements and machinery cannot possibly exhibit at more than a few of these shows, therefore competition is limited principally to local manufactures. The cost of exhibiting is great, and must be recouped by increase in the cost of implements and machinery. The number of agricultural shows held annually in South Australia could with great advantage be reduced by 90 per cent.

NUT GRASS (CYPERUS ROTUNDATUS).

This weed is frequently introduced with Dahlia roots and other plants from New South Wales and Queensland, and has already gained a hold in several places in South Australia. As it is a terrible pest, whether in garden, orchard, or pasture land, the following illustration, kindly lent by the New Zealand Department of Agriculture, will enable anyone to identify the plant.



CYPERUS ROTUNDATUS, COMPLETE PLANT WITH RUNNING ROOT AND TWO OF THE "NUTS" OR TUBERS.

Although called a grass it is really a sedge, and can readily be distinguished from grasses, as the stalk is not jointed, whilst grass stalks are always jointed. On the roots of this cyperus are a number of tubers, or so-called "nuts," which lie dormant during winter; but in early spring a number of long filamentous shoots are produced. These are true subterranean stems, covered with leaf-like scales. The shoots vary in length according to the nature of the soil, being lengthy in rich, free, loamy soils, and short in soil of a poorer and firmer nature. At the end of the shoot a tuber forms, and then a stem rises to the surface. Thus the plant spreads and spreads horizontally beneath the surface, and sending shoots up at intervals, until the whole neighborhood is covered. The tubers were at one time regarded as of value medicinally, and there seems to be little doubt that they excite the salivary glands, and are beneficial in cases of dyspepsia.

This so-called "nut-grass" is very difficult to eradicate, and yet it must be dealt with if the land is wanted for grazing or for cultivation. Various remedies have been suggested and tried, but the most successful one is to cut the plants up directly they are in flower, and after this to keep on cutting them off whenever they appear. The first cutting takes the plant at a time when its energies have been expended in the production of the flowers, and it is then necessary to make a further effort to re-produce leaves and stems. This further weakens the tubers, and every time the plants are cut thereafter the tubers are further weakened until the pest is killed.

AFFECTING EXPORT OF FRUIT, PLANTS, ETC., TO NEW ZEALAND.

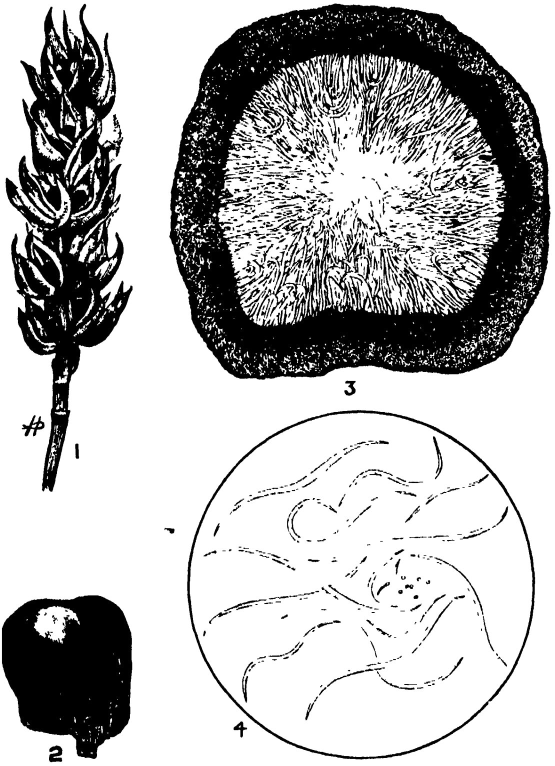
The New Zealand Government has decided that imported fruit of any kind infested with fruit fly, or in which fruit these have at any time been present, shall, on condemnation by an inspector, be at once destroyed. Any fruit or plant affected with any species of scale insect will be admitted only when accompanied with a certificate, signed by a duly appointed Government officer at the port of shipment, and bearing the official mark or brand of such officer, showing that such fruit or plant has been effectively subjected to hydrocyanic acid gas, and then only after the inspector at the port of arrival is satisfied that the treatment has been efficient. Any scale-infected fruit or plants arriving without such certificate, or which in the opinion of the inspector have not been efficiently treated, shall be fumigated with hydrocyanic acid gas, or destroyed. Fruit will only be admitted at the ports at Bluff, Dunedin, Christchurch, Wellington, and Auckland, but can only be fumigated at the last four places. Fruit and plants for Gisborne and Napier may be landed there if they have been passed at Auckland or Wellington. Live plants will be admitted only at Dunedin, Christchurch, Wellington, and Auckland. Importers have to pay expenses of carting, labor, and the moderate fee of 3d. per case for fumigation, with a minimum of 2s. 6d. for each lot.

ANTS on garden paths can be destroyed by sprinkling Paris green at the entrance to their nests. They get it on their legs, clean it off with their tongues, then die, and are eaten by their mates, which also die.

RINGWORM ON CATTLE AND HORSES.—Rub the ringworms with a stiff brush or currycomb, then rub into the spots one of the following preparations:—1. Equal parts turpentine, linseed oil, and black brimstone. 2. Powdered blue vitriol (bluestone), mixed with a little lard. 3. Oxide of zinc ointment, or mercurial ointment. 4. One ounce Little's sheep dip in ten ounces of water. If necessary, repeat treatment after four days.

EAR-COCKLE (TYLENCHUS SCANDENS, SYN. T. TRITICI).

The disease of wheat known in Europe as "ear-cockle," "peppercorns," or 'purples," is caused by an eel-worm. There are several species of eel-worms, some of which attack onions, others affect oats and other plants. The eel-worm of wheat-ears is known to most scientists as Tylenchus scandens, but some give it the name of T. tritici. The presence of this pest has been recognised on the Murray Flats for some time past, and it has been spread from thence to other parts of the colony (but chiefly in adjacent parts) by means of seed wheat. The following excellent illustration has been kindly loaned by the New Zealand Department of Agriculture:—



Description of Figures Illustrated.

Fig. 1.—Ear of wheat, slightly less than natural size, showing the galls or peppercorns. Fig. 2.—A gall greatly magnified. Fig. 3.—Cross-section of gall, greatly magnified, showing the way in which the young worms are crowded, with the casing. Fig. 4.—A few of the worms still more magnified. All from nature.

The ear-cockles occupy the place of grain in the wheat-ear. They are of a dark purplish color, and rather smaller and rounder than the grain of wheat would have been. The place in the grain which should have been flour is occupied instead by very many young eel-worms coiled up, hard, dry, and apparently dead. Upon the "cockle" being moistened, the young eel-worms swell out, become active, and burst the enveloping casing or bran, and move about in search of a wheat plant. They enter the young plants, live in the stem and leaves until the seeds are about to be produced, when they proceed upwards, take possession of the young grain, increase and multiply until the envelope is chockfull of young eel-worms, by which time the ear is dry, and the "cockle" is also dry and ready to be harvested along with the sound wheat. The eel-worms are extremely tenacious of life, and it is stated that they may be vivified by moistening, and relegated to a dormant condition by drying time after time.

When an ear cockle is crushed, moistened, and examined under a good microscope; the eel-worms quickly come to life, and present exactly the appearance shown in Fig. 4.

The plants affected can be easily detected amongst the healthy plants by a crinkled appearance, and by the rather darker color of the leaves and stems.

Wheat affected by "purples" or "ear-cockle" should always be thrown into pickle before being sown. Most of the "cockles" will float on top, and should be carefully skimmed off and burned. Diseased plants should be sought in the field, pulled up, carried off, and burned.

Whenever possible, farmers should avoid the purchase of seed wheat from fields known to be affected with ear-cockle.

FOR BEEKEEPERS.

Metamorphoses of Bees.

From the laying of the egg by the queen bee till the perfect bee is produced there are six periods or changes. These changes differ in time according to whether the bee is a queen, a worker, or a drone. Thus:—

	Queen. Days.	Worker. Days.	Drone. Days.
1. Incubation of egg	3	3	3
2. Time of feeding of larva	5	5	6
3. Spinning of cocoon	1	2	3
4. Period of rest	2	3	4
5. Transformation to nymph	1	1	1
6. Period in nymph stage	3	7	7
	15	21	24

The queen flies on her wedding trip about five days later, the worker fourteen days later, and the drone fourteen days later.

Swarming.

Swarming disorganises the work in the hive and prevents the gathering of the honey harvest. The swarming habit can be modified by careful management, or intensified by neglect of ordinary precautions. Clipping of the queen's wings is one easy way to prevent swarming; but this should be allied with a judicious removal of combs containing brood to weaker colonies, and careful removal of queen cells every eight days. Always give the bees plenty of room for storage of honey and accommodation for brood. Free use of the extractor, tiering up or supering, removal of surplus brood to weaker colonies, clipping the queen's wings, and removal of the queen cells every eighth day will give very considerable control to the beekeeper who does not desire to increase the number of his colonies. It is always desirable, however, to have two or three empty hives ready for unexpected swarms.

Clipping the Queen's Wings.

When about to clip the queen's wings, be extremely careful not to press her abdomen in any way. The proper way is to lift her by the wings in the right hand, then take her by the legs between the finger and thumb of the left hand, and clip off one-half of one wing with the point of a small pair of scissors held in the right hand, being particularly careful not to let a leg escape to be cut off at the same time. The queen bee is not at all likely to sting.

Bee Moths.

The female bee moth makes a sound like that produced by the queen bee, and this prevents the bees attacking it. She is remarkably active, and generally enters the hive about dusk, proceeding at once to some corner to get away from the main traffic of the bees. She deposits her eggs where the minute caterpillars can readily attack the combs, and they tunnel in every direction, lining their tunnels with a fine silken web. If the bees could get at the caterpillars (or "grubs" as they are often wrongly called) they would quickly destroy and expel the enemy, but the silken web prevents this. In time the caterpillars leave the combs, and enclose themselves in thick cocoons all over the woodwork of the hive, until there are thousands of them. These go through various changes until they come forth as moths, and ultimately caterpillars are produced in myriads, sufficient to drive the bees out of their home. By holding up a frame of comb to the light the tunnels of the caterpillars can easily be seen, and a sharp-pointed knife can be used to cut them asunder. When the moths or caterpillars are numerous in a hive, it would be best to transfer the bees to a clean new hive, together with a frame or two of clean brood comb if procurable. Melt the comb in the affected hive, and either scald thoroughly or subject the whole of the frames and old hive to sulphur fumes for an hour or two.

POULTRY NOTES.

By D. F. Laurie.

Exporting Poultry.

The information recently published anent the poultry export trade deserves a few remarks. *All poultry intended for the English market must be shipped to arrive at the season of high prices.* To send poultry at other times is as bad as "sending coal to Newcastle." Our geographical position lends itself so that we can breed and ship birds to arrive on a good market. It seems a difficult matter to impress on the exporting producer that age and condition are two potent factors. The demand in England is not for large, coarse birds, but, on the contrary, for young, tender, plump birds of medium size. It is folly to ship birds to arrive out of season; the prices realised are no more, if as much, than may be realised locally. The fact that two recent shipments—one of young ducks and the other of so-called chickens—have both been pronounced too old by the London salesmen should take a little of the assertiveness out of some of our "experts." The whole success of the export trade depends on our supplying the market with its exact requirements. All the poultry Australia can ship for years to come will have no effect on London prices, and any attempt to force what is not demanded on that market will surely result in well-merited disaster. To ship poultry to England which is too old shows a want of good management; the birds have been kept too long and have cost too much, and therefore the profits must diminish. The nonsense about large table birds and capons for export did much harm. It must at once be realised that what is required for the English trade is quality and not quantity. We hear a lot of the superior quality of English and French poultry; we can produce just as good in Australia, and certainly this colony must occupy a foremost position.

I am very glad to see that the subject of poultry-keeping, and the consequent improvement in feathered stock, is gaining general recognition. When lecturing I did not preach poultry farming as a sole industry; but, as most people kept poultry, it would be as well if they were acquainted with the best and most economical varieties, and the best methods of breeding, feeding, and rearing.

Sick Fowls.

I am now in daily receipt of the usual budget of bad news which generally comes to hand with the advent of the warm weather. Few people seem to give full value to the word "cleanliness." It is essential in a climate such as ours is in summer, with its frequent rapid changes of temperature, that the greatest attention should be paid to hygiene. It is becoming more patent than ever that most diseases are spread through the medium of germs, and therefore we must be on our guard. Accumulations of droppings and other filth, old rule of thumb methods in feeding, lack of ventilation, &c., all exercise strong influence, and due attention must be paid thereto. If unsound food is given, and the birds are allowed to (or rather forced to) drink stagnant, filthy water, it stands to reason that there must be some evil results. Most, if not all, of our summer epidemics are due to the practice of throwing soft food on the ground, often completely saturated with droppings, which adhere more or less to the food and are consumed to the detriment of the birds. Under very exceptional conditions the practice of throwing soft food on the ground is all very well, but when, as is generally the case, this food is thrown on filthy, muddy ground, the effects will soon declare themselves. Poultry need sound food, clean, fresh water, shade, egg and eggshell-forming material, and, further, the young stock require help to bring their frames into fit condition to carry out all that is required.

It will be wise to keep only such breeds as will either lay the greatest number of eggs for the lowest outlay, or such as will be fit for export, or will bring the highest local prices. We have not progressed so far as our Surrey friends in England, or the French; we have not yet established district breeds. When we do, provided the foundation is right, we shall find much greater profits accrued. I meet so many country friends who have purchased stock here and there, that a fair opinion can be formed as to the reasons why so many birds die soon after arrival in a strange locality. Often the birds are carelessly packed, or are placed during transit in such a position that they do not get sufficient air, and, if not suffocated, get overheated and sweat; exposure of such birds to the cold air generally results in a chill, which terminates in roup or pneumonia as a rule. Again, change of water may cause scouring, which often takes a bad form, and should be guarded against by giving boiled water, and that sparingly. Birds which have been carefully housed, perhaps too much so, should not be allowed to roost outside in very cold weather until acclimatised. On the other hand, birds which have hitherto led a free existence and slept in trees are very liable to die when transferred to poultry houses. After a journey it is always well to feed on warm bread and milk which has been boiled; sufficient ground ginger may be added to give it a characteristic flavor. The water should be boiled, and only a little given at a time. In many cases it is the fault of the breeder who keeps his breeding stock and rears their young under insanitary conditions. Constitution and health must ever be the goal of the breeder. Of course, many people purchase poultry which die simply through lack of attention. Some people rarely lose a bird; others again seem unable to keep them from dying. Birds generally become acclimatised in two or three weeks with care.

EXPORT OF BUTTER.

During the past few months considerable quantities of "store" or "milled" butter of inferior quality, *i.e.*, small lots of dairy butter obtained from country storekeepers and hawkers, and mixed in Adelaide, have been exported through the Produce Export Depôt. Much of this butter is of a very inferior nature, and some of it has been exported in boxes bearing brands such as "Prime South Australian Dairy," "South Australian Creamery"—such and such factory—and similar misleading descriptions. In the opinion of the Dairy Instructor the sale of such butter under such descriptions was likely to seriously injure our good name, and to damage the dairying industry of the whole colony. The matter was brought under the notice of the Hon. Minister of Agriculture, who decided that it was against the best interests of those engaged in the dairying industry that such butter should be sold as South Australian or Adelaide factory or creamery butter, and he has therefore instructed shippers that the Department will not accept such butter in boxes bearing the brands "South Australia" or "Adelaide." In this action the Minister is supported by the Dairy Board.

Considerable misrepresentations have been made by interested parties as to the effect of the decision referred to, it being stated that it will injure the small dairyman, prevent the export of butter for which there is a demand in London, prevent second-grade factory butter being shipped except as "pastry," and generally play into the hands of the larger factories. All these statements are absolutely incorrect, and to remove any misapprehension which may exist in the minds of owners of small factories and creameries, a statement as to the method adopted in classing butter may be desirable.

All butter received at the depôt is sampled by the Dairy Instructor. Any ordinary good butter is branded "Approved for export"; inferior butter is not branded, and very inferior is marked "Pastry." The two latter must not be branded Adelaide or South Australia. It has been stated that our method is more severe than in the adjoining colonies, where two or more grades are made and passed for export. This is not so. The stamp "Approved for export" is placed on all butter which would come up to the second standard adopted in the other colonies, and the butter that falls below such standard is of very poor quality and no credit to the colony. In Victoria very inferior butter is rejected, but in this colony if anyone desires to send very poor quality butter there is nothing to prevent him doing so, provided he does not do the whole of those interested in dairying an injury by selling the same as South Australian or Adelaide butter. It has also been stated that the London purchasers pay no attention to the brands upon the boxes, but buy by sample. This is doubtless true, but it is not the London buyer who eats the butter. The retailer would doubtless sell the butter as South Australian butter, and the consumer who got an inferior quality would not be a buyer the next time South Australian butter was offered him, no matter how good it might be. With the keen competition in the British market, it is imperative that every care should be taken to prevent any suspicion of inferiority falling upon South Australian produce.

FAULTS, ERRORS, AND LOSSES IN CHEESE-MAKING.

By G. S. Thomson, N.D.D., Dairy Instructor.

As losses in cheese-making are occurring in factories through imperfect milk and utensils, errors in manufacture, and unsuitable making and ripening rooms, it will be well to draw attention to some dangers, and recommend means of prevention and remedy.

It is safe to infer that a few cheesemakers are far from being aware of the onerous nature of their duties, pay too little attention to many items in the process of making, and to a considerable extent leave the cheese to take care of itself. Cheese-making requires the most observant attention, and the maker must be a man difficult to please—one who trembles at the sight of anything uncleanly in his factory. Let it be understood that a bad odor from insanitary drains in a making-room, or a bad odor finding entrance from outside sources, will damage and may lead to ruin in the quality of the cheese manufactured. Travelling from factory to factory I am becoming familiar with the weaknesses, and have notified the causes of considerable losses in the making of cheese. It is, however, far too true that the key to many a failure and loss is traceable to the supplier, and the contamination with taint-forming microbes before the milk reaches the factory has been already demonstrated. Why should this source of loss be so unheeded, when a remedy requires but little skill? If it were possible to show dairy farmers what a grain of dirt contains in the form of life, much greater care would be taken to provide a purer and cleaner milk supply. Again, makers are forced to face the obstacles accompanying the addition of preservatives to milk, the influence of which retards in the vat what the maker desires in the way of producing a good and wholesome cheese. As dirty milk most readily receives the preservative it will be well to briefly mention what takes place. Preservatives exert destructive and checking influence over the life of the flavor-producing ferment; but the repulsive enemies common to contamination, which are better able to resist chemicals flourish in the absence of their otherwise more powerful opponents, hence the development of taints and putrefaction in the cheese. Again, the quality of cheese will be sour and insipid when carefully-handled sweet milk is chemically preserved. These faults result from the inability of the lactic ferment to accomplish its duties, which in turn increases the period of coagulation of the renneted milk, causing delay in the development of acidity in the curd during stirring, and when settled in the whey for an abnormal period the evil is finally wrought. Boiling milk to extend its keeping quality has also been practised, and when done to an extent the quality of the cheese will be invariably weak and flavorless. It is earnestly hoped that in the coming hot weather the above practices will be abandoned, and that suppliers will supply sweet and clean milk to the factories.

Utensils.

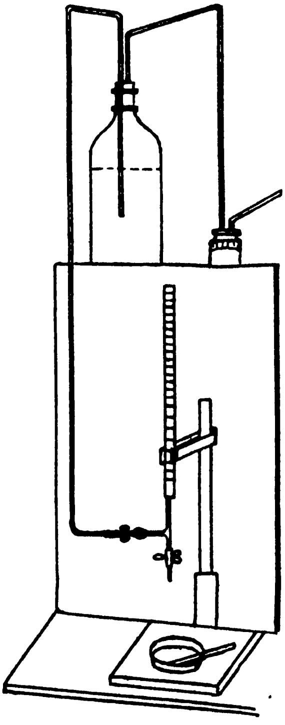
In our colony inferior cheese has been traced to want of care in cleansing the milk cans, and upon one occasion I discovered the flavor of putrid whey rising from the heated curd in a making of cheese. Managers ought to strongly impress upon suppliers the necessity of scalding milk cans, not only at the factory, but also at the farm; and when whey is taken from the factory, steaming and scalding with boiling water and soda, and washing must be thoroughly attended to. The same treatment will apply to vats and syphons and all cheese-making utensils.

On the arrival of milk at the factory, and following the necessary examination, it is received into the vat, when it ought to be stirred as frequently as convenient to facilitate the escape of foreign and natural odors. This simple operation unquestionably does good in the way of making a wholesome product.

With strainers, keep continually washing off dirt that may collect. It is not uncommon to see a milk-strainer completely discolored with grains of dirt, pieces of straw, and hairs from the vessels and bodies of cows. The dirt in itself will not do much injury after it has been thoroughly cleansed with the repeated washings of milk, as the taint-producing germs have already gone into the vat, and what is left behind is merely an indication of their presence in the milk. Considering the condition of vats, I would direct the attention of all cheese-makers to the necessity to make frequent examinations for the presence of holes, as on more than one occasion cheese has suffered from the introduction of dirty water into the curd, escaping from the heating space betwixt the two covers. I have known this to happen, and the heating water to be quite milky, whereby disagreeable odors filled the immediately surrounding air and found their way into the vat. It is recommended to remove the vat from the outside cover, or heater, and to thoroughly wash the inside from all impurities once a week. Unless this is done, the bad smells which form in the dirty water become a source of much danger in the making room.

The Acid Test.

The main object in writing this paper is to again advocate the introduction of the acidity apparatus into all the factories. It is valuable for the testing of cream for butter-making milk, as it is received at the factory for separation, milk suspected to contain preservatives, and in my opinion it is indispensable for testing the condition of milk to be used for the manufacture of cheese, and as a guide to the working process. Let one consider the delays and losses incurred in cheese-making throughout the cool weather, and also the losses sustained in summer. The question may be asked "Is there no check whereby losses could be avoided ?" The foundation of the error is found in renneting the milk before sufficient acid has developed, which checks and delays the coagulation of the milk, provokes a sluggish development of acid during scalding, and prolongs the period during which the curd is set in the whey, and at the time of its removal souring of the soft curd will be evident. The answer is, be guided by the use of the acid test. In the hot summer weather the acidity of milk is permitted to proceed so fast that the maker is unable to keep it in check. In the Dairy Institute of Scotland students are taught the use of the test daily, and not one gallon of milk is rennetted by the rule-of-thumb, but by the percentage of acid recorded on the graduated tube of the acid apparatus, or by a more difficult means—the cup test.



Explanation of the Apparatus.

The large bottle shown in the sketch contains a solution of caustic soda of the standard strength, (*i.e.*, 1 c.c., will neutralise 0·01 grammes of the acid of the milk) The top of this bottle is closed with a rubber stopper through which two glass tubes enter. That on the right is the air tube, which does not come into contact with the caustic soda solution. The tube on the left conveys the solution to the graduated tube or burette. The smaller bottle on the right contains caustic soda and phenol-phthalin, and through the small tube on the right the air enters, to be purified by the carbonic acid gas before it passes through the air tube to the bottle containing the caustic soda solution. When the caustic soda and phenol-phthalin mixture become pale, a fresh supply is necessary. The burette is marked with 200 divisions of 20 c.c. or ten divisions to the c.c. A pinchcock is affixed to the glass tube communicating with the burette, and another below the burette for admitting the caustic soda solution to the milk to be tested. The top of the burette is closed with an indiarubber stopper to prevent the admission of air when not in use.

Using the Test for Cheese-making.

By means of a glass pipette 10 c.c. of milk is taken from the vat, and run into a porcelain dish as seen on the stand. Into this is put three drops of phenol-phthalin from a stoppered bottle. (Phenol-phthalin is the liquid used as an indicator to show when the acid in the milk is neutralised by the soda from the burette). After stirring in the phenol-phthalin by means of a glass rod the porcelain dish is placed directly under the burette, and with the left hand the pinch-cock is opened and the caustic soda allowed to drop into the milk. With the right hand the operator stirs the mixture together. If ordinary sweet milk is being tested a red coloration will be momentarily visible, disappearing on stirring; but when a faint pink color remains, the reading of the burette must then be taken. Care is required with the pinch-cock, as a few drops of excess of soda would seriously alter the time of renneting. When the number of c.c. have been counted, the pinch-cock is gently pressed to admit fresh soda to replace what has been removed A float in the tube makes the determination of the reading an easy matter

If the loss of soda shows nineteen divisions the percentage of acid in the milk is 0.19. If, on the other hand, twenty-five divisions are required, the lactic acidity would be 0·25 per cent. Milk, as it comes from the cow, will contain about 0·19 per cent. of an acid, and to make cheese from so low an acidity as the above would be ridiculous without the assistance of a starter. But we have been renneting milk in cool weather with 0·20 per cent. and 0·21 per cent. of acid, with a result upon the quality of the cheese and a delay in the making process which I have already explained. With the test as a guide the cheesemaker would not add the rennet until he obtained a reading not lower than 0·22 per cent., but if it was 0·25 per cent. he would immediately have to rennet without delay, and put into operation throughout the making process alterations from the general routine of making, as a check upon the quick-forming acid. (The treatment of fast milk is given in the *Journal of Agriculture* for September, 1898.) Employing the apparatus at the running off of the whey and at the pressing of the curd, excess of 1 per cent. of acid at the latter operation is an error.

Fixed rules cannot be made to suit all, but from a little experience the cheesemaker will readily determine the exact quantity to develop to suit his district and climate. Experiments in this colony will be conducted from time to time, and the results published in the *Journal.*

Other Uses of the Test.

Fresh milk from cows suspected of giving trouble in cheese-making through illness or improper feeding can be ascertained. It is not uncommon to find a low acid reading with an unhealthy animal, and a high reading when the cows have been fed on certain foods. Suppliers' milk can be individually examined on arrival at the factory, and when an excess of acid is determined, the cause can be sought after and a remedy prescribed as to the future treatment of the milk. Preservatives can be detected, particulars of which are given in the *Journal* mentioned. I have been using the above apparatus for a considerable period, and consider its use invaluable, not only in the laboratory, but wherever large quantities of milk are received, either for butter or cheese making. The complete apparatus and chemicals may be obtained at a cost not exceeding £1 15s., and those who desire to procure such an aid to modern dairying might communicate with me, when I will have orders promptly attended to. The bottle of soda solution will last for a considerable time in the hands of a careful person, and to become a competent manipulator of the test requires but short instruction, which I will be only too pleased to give.

Curd Test.

There is a test employed in factories in America for detecting impurities in suppliers' milk, which is known by the name of the Wisconsin curd test. When stringy, floating, or badly-flavored curd is observed, the supply of faulty milk is looked for by the following means. Thoroughly steamed pint glass jars are three-fourths filled with suspected samples of milk and correctly numbered. The bottles are placed in a tub of heated water until the temperature of the milk reaches 98° F., when the milk is renneted with ten drops of rennet Special caution is necessary in using a thermometer, which must be thoroughly cleansed after taking the temperature of each lot, and stirring in the rennet requires careful attention, otherwise pure samples of milk might become contaminated. When coagulation has taken place the curd is cut and the whey removed. After twenty minutes the remaining whey is poured off, and the temperature of the water surrounding the jars is kept at 98° F. for the next twelve hours, giving time for the curds to ferment. Each jar of curd is now cut up with a sharp knife and carefully examined for holes and sponginess in texture and bad odors. The mouths of the jars must be covered with damp muslin throughout the test.

Ropiness in Milk.

At two factories I have observed distinct ropiness during the cutting of the curd, and attribute the cause to want of attention in the careful treatment of the milk. In such cases the above test would be an assistance to managers in ascertaining the trouble. When the fault is first seen special precautions are required in the factory in regard to thorough cleanliness of all cheese-making utensils. In other two factories a fæcal taint in the cheese of one or two makings has given rise to considerable loss. Bacteriological knowledge points to the source of this evil as associated with sewage water or dirt coming into contact with the milk. Factories having suffered this serious difficulty ought to be protected from a recurrence from contamination lodging in building by a thorough cleansing of the entire building and a careful examination of drains, both in and outside of the factory.

As time advances I hope to be in a position to make bacteriological examinations to discover the means of entrance of taint-producing bacteria.

Curing Room.

The high temperature of our curing rooms throughout the summer reduces the weight and value of the cheese to an extent much greater than is generally believed. To make the rooms proof against the influence of heat is impossible, but some provision could be made to lessen the losses without incurring a heavy cost. The following is said to control the temperature to a considerable extent:—The old walls, floors, and ceiling should be scrubbed with water and allowed to dry. A double covering of building paper is put on, and furring strips are nailed over the paper. On the strips another double covering of paper is put, and finished with tight-fitting wood, which is finally whitewashed. Whitewashing is unnecessary for the floor. Double doors and windows should be placed in the room. To provide for a current of cool air, an underground drain would require to be constructed of a length not less than 70yds. from the floor of the room, and with a depth of about 14ft The duct should have a diameter of 1ft., and on the outer end an upright iron pipe is placed 12ft. high with a weather cowl on the top. Suitable material for the construction of the duct would be common drain tile; a ventilator from the ceiling of the room through the roof is necessary.

Barrel of Apples.—Several of the American states have adopted a legal standard measure for the barrel of apples, *i.e.*, three bushels to the barrel. Several of the large fruit exchanges have also adopted this standard, refusing to buy apples put up in other packages, and it is stated to be well within the bounds of possibilities that the National Legislature will adopt the standard for the whole of the States,

SCIENTIFIC FARMING.

The opinion so general amongst farmers a few years since, and still held by a good many, that scientific farming was only profitable on paper has been proved by a goodly number of South Australian farmers to be fallacious. In no farm in the colony are there better illustrations of this than at Hope Farm, near Wasleys, where Mr. R. Marshall has been farming for the past thirty-three years. The land which Mr. Marshall first took up on lease had starved out the previous holder. Mr. Marshall's ideas of farming—one crop in three years and feeding the soil—did not meet with the approval of his neighbors, who confidently predicted that he would come to the same end as his predecessor. The fact that the original holding has been purchased, hundreds of pounds spent in improvements, implements, &c., and several of the neighbors bought out, until the area of the holding is now about 3,500 acres, is ample testimony to the profitable results of farming on sound principles.

On being asked the principal reasons for his success, Mr. Marshall lays special stress on the value of early fallow, thorough working of the fallows, selection of seed, and manuring. He considers early fallow—and he likes to have all the land fallowed by end of June—worth two or three inches of rain as compared with late fallow. The fallow is kept clean and open by constant working, and the land is even then not expected to return a good crop without the addition of plant food in the way of commercial manures. For the past twenty-eight years manures have been used on the farm, and up to within the past three or four years bonedust was used. Now, however, Mr. Marshall finds English super. the most profitable. The outlay for manure alone comes to about £200 per annum. As a rule about 1cwt. per acre is used. The effect of manure in hastening the maturing of the crop is specially noticeable. In the various paddocks where small patches have received no manure the wheat was only just coming into ear, whereas the bulk of the crop was well out, and the heads contained well-developed grain,

The question is frequently asked—does not super. force the wheat and rob the soil? A splendid object lesson on this point can be seen on a slope which was under crop last year. Although fed down by stock, at a distance of a quarter of a mile or more from the opposite rise a patch the width of the drill where no super. was used can be seen very distinctly, the feed being different in color and less in quantity than on the manured portion. About 1,000 sheep are kept on the farm, principally on land left permanently in grass, and by careful breeding and culling the wool is of a high quality and the clip good. Returns from the second wool sales this season were of a most satisfactory nature, up to 10½d. per pound being obtained.

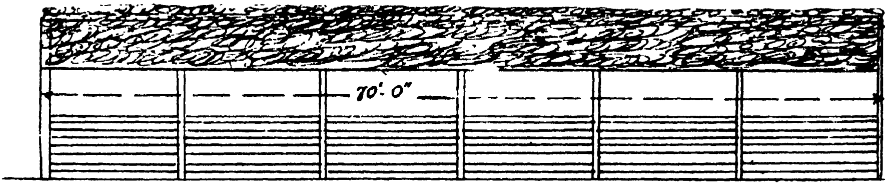
Mr. Marshall has now given up active interest in the farm, which is carried on by his four sons, who this year have over 700 acres under crop, the whole of which is of a most promising nature; and considering that the rainfall since the crop was put in has been only about 9in., it is remarkable that such strong, healthy growth should be shown by the wheat. Recently a visit of inspection was paid by the writer to the farm for purpose of noting the new varieties of wheats being grown by Mr. Marshall, whose name is well known as the originator of a number of wheats of high quality. For the past thirty years he has been engaged in endeavoring first to obtain wheats that would resist red rust, and latterly with the additional qualities of earliness, strength of straw, and good yielding and milling qualities. The method adopted at first was to sow for seed wheat grain from heads specially selected from the crop owing to their being superior to the bulk in the characteristics mentioned, but later on the crossing of wheats with one or other of the desired qualities, in order to get a combination of the same, has been undertaken with very successful results. Numerous crosses by Mr. W. Farrer, of Queanbeyan, New South Wales, have also been tried. Mr. Marshall's ambition has been to obtain a good early rust-resistant and solid-strawed wheat of good milling quality, and of the many hundreds of selections and crosses tried only about a score are now being grown, and several of these will not be grown again. As showing the care and patience required in obtaining a new wheat, the experience with Marshall's Early Solid Straw wheat may be mentioned. One of the parents was a bearded solid straw wheat of Mr. Marshall's own selection. The progeny contained a number of bearded and a few beardless solid straw plants. These latter were selected and sown, and each year the percentage of bearded heads got less, until last year, after eight years' culling, it was thought the variety was pretty well fixed. This season, however, a fairly large percentage of bearded heads are to be seen in the crop, though specially selected seed in the stud plots only shows an occasional bearded head.

The bulk of the crops consisted of Majestic, Silver King, Marshall's No. 3, Early Para, Marshall's Early Solid Straw, Bartlett's Cross-bred, and Indian King. About sixty acres of the first named was 4ft. 6in. high, beautifully headed and promising equal to 20bush. per acre. About twice the quantity of Silver King wheat was not quite so high, but very healthy, with heads if anything better. The two wheats are Mr. Marshall's own selections; both are fairly early, the former being solid straw—though occasional plants show a slight hollowness—and the latter thick and strong in the straw, while both are rust-resistant; both would make good hay wheats, and the paddock would average about 2 tons per acre. Marshall's No. 3 wheat was not quite so promising, being sown later, but considered equal to 16bush. to 18bush. This wheat is highly praised in the other colonies, especially in Queensland, where it has this season escaped with very little injury from frost. Early Para wheat worth quite 2 tons to the acre was being cut for hay; by constant selection of the best beardless heads, Mr. Marshall has got a strain which is nearly free from beard. Marshall's Early Solid Straw alongside was sown thinner, but will cut as heavy, as the straw being solid weighs better. Indian King, one of Mr. Farrer's crosses, had been cut for hay, the crop being good. Being an early, rust-resistant wheat, Mr. Marshall was strongly impressed with this wheat when growing it in comparatively small plots, but this year it shows signs of weakness of the straw—a characteristic of Indian wheats—and as he has better varieties it will be discarded in the future. Bartlett's Cross-bred wheat, of which there was about seventy acres, was not quite so good as the Majestic and Silver King, but this is due to its being sown latest of all, and in a paddock which has been cropped oftener than any other part of the farm. Last season, sown side by side with Early Para, it came into ear over two weeks earlier, and would probably have ripened as much earlier, but the latter being cut for hay no record could be kept. This wheat was sent to the Agricultural Bureau about seven years ago as a selected early rust-resistant wheat, and a few grains came into Mr. Marshall's hands as a member of the Wasleys Branch. All traces of the ancestry and the donor of the wheat has been lost, but from the few grains referred to, grown each year since, Mr. Marshall reaped last year over 160bush. from six and a half acres. As the wheat is very early, of good quality, holding its grain well, and staunch in the straw, Mr. Marshall recommends this variety very strongly, especially for the northern areas, as, owing to its earliness, it is less likely to be affected by the dry spring weather so frequently experienced. The editor would be glad to hear from anyone who can give information as to where this wheat originated.

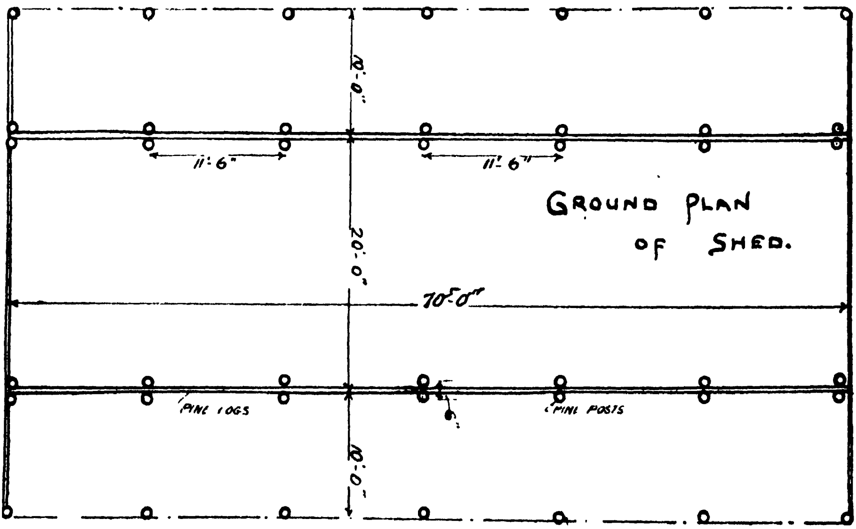
In the smaller plots of wheat a number of new varieties are being tried. Of these the best is probably Ranjit, an early variety, with splendid ears and good straw. Marshall's Hybrid is also exceedingly promising, and several acres of each of these on unmanured land, grazed during the past five years, should give 18bush. to 20bush. per acre. Other new varieties, mostly solid or nearly solid, beardless wheats, of which Mr. Marshall entertains a very high opinion, are Federation, Australian King, Herculean, Kestral, Gallant, Novelty, Snowflake, Roseberry, and Field Marshal. Several of these are of his own crossing, while others came from Mr. Farrer. A wheat imported from Germany by Mr. F. Krichauff, and known as Epps, is an absolute failure, being only about 15in. high alongside others sown at the same time and now 4ft. to 5ft. high. It is very late, and will give but little grain. Of all the early wheats grown by him, Mr. Marshall favors Bartlett's Cross-bred and Ranjit as being the best. Not a sign of bunt was noticeable in the crops, and in reply to a question, Mr. Marshall stated he always pickled with bluestone and was never troubled with bunt.

Although he has now retired from the farm, his sons are carrying on operations, and follow in their father's footsteps. Mr. Marshall himself is making a number of crosses of the different wheats possessing the qualities desired, and the results will be sown in hand plots next season, and subjected to the same process of culling and selection referred to.

Besides the wheat crops, many other matters of interest came under notice, including blacksmith's and saddler's shops, shed for cocky chaff, ensilage stack, Shropshire rams and ewes, improved implements, &c. One of Messrs. Marshall Brothers does the greater part of the blacksmithing required. All except the more intricate jobs are done on the farm—gates, iron standards for fences, and various contrivances for facilitating the work of the farm being made by him.

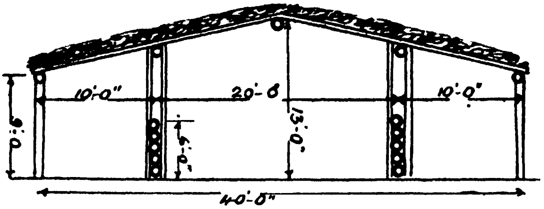


SIDE VIEW OF SHED.



GROUND PLAN OF SHED.

Repairs to harness, and manufacture of reins, traces, &c., are also undertaken. Very nearly twelve months' time was spent by Mr. Marshall, jun., with a competent smith, without payment; in fact, a premium was paid to teach him the work, and the saving in expenses, and especially in time usually lost, repays the present and past proprietors many times over for the time spent at the smithy. The shed for "cocky chaff" will hold about 20 tons, and is well worthy of being copied where timber is handy. The shed is built of gum or peppermint posts and pine rafters, and well thatched with straw. It is about 70ft. long by 40ft. wide; along the whole length a rough enclosure 20ft. wide is made to hold the "cocky chaff." Gum posts, which support the wallplates, are set in the ground each 10ft. to 12ft., and about 6in. from each a pine post is placed, being set in the ground to secure firmness, and lashed with wire or bolted to the gum posts at the top; pine logs 12ft. to 14ft. long are laid one on top of the other between the two sets of posts and the chaff filled in. As the heap increases in height more logs are added, until the enclosure is nearly full. The grazing stock obtain shelter from wind and sun under the thatched roof, and help themselves to the chaff, reaching over the topmost log for it. As the heap is consumed one or two logs are removed at a time, and thus the stock obtain what they want and waste scarcely any. To prevent the stock getting into the enclosure and fouling the chaff when the logs are low, a stout wire is run from post to post, about 4ft. from the ground. In a shed of this description, costing nothing but a few shillings for bolts, and a little labor during slack times, the "cocky chaff" could be preserved for several years as a stand-by.



END VIEW OF SHED.

ORCHARD NOTES FOR DECEMBER

By George Quinn, Horticultural Instructor.

The fruit harvest, which began favorably last month with strawberries, has been fairly good for that fruit. The anxiety respecting the supply of moisture to develop the "second" crop having been relieved by a good thunderstorm in November, growers have been able in most instances to fill the demand. It is gratifying to note the general use of the chip punnets in marketing this delicious fruit, and householders can now procure their supplies almost as sound as when gathered.

The showers of rain and cool changes so favorable to the strawberry-grower have been sources of anxiety to the producer of cherries, and the cracked, decomposing fruits seen at times in the shops tell too plainly the reason for such forebodings. These fruits are also largely exported in small chip punnets, which in turn are packed in crates made to hold a certain number of punnets. By these means our delicious samples are enjoyed in West Australia while in a sound condition.

The crop of peaches promises to be good in many localities fortunate enough to escape damage from the late frosts. The time for thinning is over, and now every effort should be made to secure a good sample by means of feeding the tree. A plan successfully followed by a leading local grower is to make a basin around each tree, into which a couple of barrowloads of fresh stable manure are spread. The basin is then filled with water, and the readily soluble portions of the manure are made available to the roots, while the bulk litter remains as a mulch to conserve moisture and keep the root system cool.

Apricots are promising well for a crop where frosts have not interfered, and the harvest will soon be upon us. Those who are about to begin canning, pulping, or drying should lose no time in procuring the plant necessary for such operations, as when this fruit begins to ripen no time remains to prepare. It would appear that the best apricot pulp sent from Australia to London has a good chance of holding its own with the pulps of southern Europe, and at a payable price to our growers. Every large grower here should be prepared to pulp or dry his crop. With these reserves to fall back upon the jam-maker cannot dictate terms. Anyone going through a wholesale grocer's warehouse now cannot but remark with astonishment the great number of names of leading fruitgrowers who have of recent years taken to putting their crops before the public in the shape of jam. This must surely be the outcome of starvation prices having been offered for their produce by the few large and old-established firms.

The crops of plums are scarce, and good prices must rule.

Apples and pears show to fair advantage, but in the ranges near Adelaide those erstwhile dormant scourges, the Fusicladiums, are making their presence known in a disastrous manner. The showery weather during spring has produced ideal conditions, and I venture to predict, should such weather prevail a little longer, next year will see a boom in spraying with Bordeaux mixture.

Recurring again to the preservation of fruits. It is within the reach of almost every householder to can or bottle a few bushels of fruit of different kinds. Apricots at 3s. 6d. per bushel case may be canned and eaten at very little more cost than baker's bread, and in both winter and summer form a delicious, healthy food. The process of canning is simple, and any person of ordinary intelligence can preserve apricots tolerably well in this manner at the first attempt, with no other guide than a printed recipe, procurable at the office of the Agricultural Bureau.

In the drier parts of the colony where water is available irrigation will be practised freely now. Always try to get the water well into the subsoil by means of a slow flow. Much of the irrigation practised would appear to have for its object the passing of the water as rapidly as possible along certain furrows. This only moistens a shallow depth of soil and causes the roots to rise into the surface layers, where they are more subject to droughts or damaging salts which have been left on the surface by the escaping moisture. Always remember the more irrigation employed the more working is required, both on the surface to prevent caking and cracking, followed by rapid evaporation, and in the subsoil to prevent the formation of impervious glazed, hard pans, through which neither air, moisture, nor roots will penetrate.

In localities where the flow of sap cannot be regulated by artificial waterings budding should be performed in spring and early summer, while there is still an active movement caused by the soil moisture stored in winter.

At this period of the year buds may be inserted into limbs 2in. or 3in. in diameter with every hope of success. Buds inserted some time ago should be examined, and the ties loosened where union has been effected.

The simple method of bending the petiole of the inserted bud back towards the ground gently usually reveals in about ten days after insertion whether the bud has united with the cambium layer of the stock plant.

The disbudding of misplaced shoots upon newly planted trees, and the suppression of all suckers arising from roots should be attended to promptly.

Citrus trees should be kept supplied with moisture in such a manner that they do not "curl" the leaves. Once permitted to get dry at the roots, great care is required in applying water if the green fruits are to be prevented from falling.

Scale insects will be breeding freely, and resin wash should be used as a spray upon them as often as possible.

The larvæ of codlin moth will be very active as the month proceeds, and weekly examinations of all bandages should be followed. All sticks and foreign substances should have been removed from near or among the trees, so that no other harbors than the tree stems and bandages are available. Fallen infested fruits should be collected and submerged in water for a day prior to being fed to animals. Thoroughness in circumventing this pest at every known turn can alone bring results. The slipshod scraping and bandaging so frequently seen are only so much labor wasted, simply because they are performed without the exercise of intelligence.

NOTES ON FRUIT PESTS.

By George Quinn, Horticultural Instructor.

In a recent visit of inspection through the orchards, in the hilly country located between Mount Lofty and Gumeracha, I had a fair opportunity o' noting matters in connection with fruit production. The fruit crops are of a variable character, and on the whole are "patchy." Plums are scarce in most orchards. Apples promise a fair crop, but pears are somewhat scarcer. The damp changeable spring has supplied conditions favorable to the rapid development of the "scab" diseases—Fusicladiums. In some orchards the foliage is yellowed, and more advanced patches of the disease have cracked.

The fruits on many apple trees are showing spots of disease, even at this early stage, which augurs badly for the future development of these fruits. In some orchards the owners had sprayed, but many who have realised in the past the restrictive power of Bordeaux mixture have been lulled into letting the "time slip by" owing to the comparative immunity of the fruits from this disease during the past dry seasons. Apricots, plums, and cherries are all attacked more or less with "shothole" diseases, and in many gardens the cherry trees have lost all of the fruits and young foliage. Varying causes are cited as being responsible for the damage, and one grower attributes the damage to frost and cold cutting winds.

In several orchards a scale insect closely resembling Mytilaspis pomorum was seen upon the apple trees, but it does not seem to increase or spread upon the upper branches of the trees or infect the fruits in the manner peculiar to the above-named pest. In these localities there are many old apple trees planted before the advent of the American blight-proof stocks. These are much attacked by the woolly aphides (Schizoneura lanigera), and upon these trees, and others affected by the common apple aphides (Aphis mali), thousands of egg clusters, larvæ, and pupæ of the large spotted ladybird (Leis conformis) could be seen. This insect is a grand destroyer of the woolly blight.

Most of the orchards in the hills are affected by codlin moth, but it is gratifying to note the improved attention being paid in the suppression of this pest. Some growers who until recently paid little attention to this work have scraped the tree stems, and are hoeing over and cleaning ground which has lain uncultivated many years. One large grower, holding over sixty acres of apple and pear trees, has for the first time scraped the stems very carefully, as he seems to have awakened to the need for trying to save his crops.

Some growers have left the old bandages on the stems through the winter and stray moths have hatched from them, thus causing a leakage. Others are using bandages that are too rotten for the purpose, and should be burnt.

In scraping the stems and leaving the upper limbs clad in old dead cracked bark, the orchardists are only half doing the working and wasting time.

MYLOR TYPICAL ORCHARD.

On Friday, November 10, 1899, the first official visit was paid to the typical orchard at Mylor. The party included Mr. T. H. Brooker, M.P., Chairman of the Board of Governors of the Botanic Garden (under whose control the orchard is placed), the Right Hon. Sir S. J. Way, and Messrs. J. W. Castine,. M.P., and A. M. Simpson (members of the said board), the Premier (Right Hon. C. C. Kingston), the Minister of Agriculture (Hon. R. Butler), the Commissioner of Public Works (Hon. J. G. Jenkins), the Chief Secretary (Hon. J. V. O'Loghlin), Messrs. C. M. R. Dumas and A. H. Peake, M.P.'s, T. Duffield (Secretary to Commissioner of Crown Lands), J. Bath (Secretary to Minister of Education and Agriculture), A. Molineux (General Secretary Agricultural Bureau), and M. Holtze, Ph. Dr., &c., &c. (Director of Botanic Garden). Mr. A. von Doussa, M.P., was unavoidably absent.

The establishment of this typical orchard originated from a recommendation by the Agricultural Bureau, which was supported energetically by the Minister of Agriculture at that time (Hon. J. A. Cockburn, M.P.). The Bureau was aware that fruit nomenclature was inextricably involved in confusion, many varieties being known under several different names, which names were also attached to other varieties also bearing several names properly belonging to other sorts. It was therefore recommended that a typical orchard should be established under the care of the Director of the Botanic Garden, and that he should procure truly named varieties of all kinds of fruit from several reliable sources; that these should be cultivated, compared closely one with the other, so that no doubts should remain with regard to the correct name of each variety of fruit; that the relative good and inferior qualities of each sort should be carefully noted in every way; that buds and scions should be available (under proper conditions) to all applicants; and that the orchard should be conducted strictly on educational and progressive principles, and not with a view to competing in any way with fruitgrowers.

Whilst the situation of the orchard may not be the very best that could have been selected, there are many advantages attached to it, and it is certainly not out of the way for those who are really interested in horticultural pursuits. The soil is rather poor, sandy, upon yellowish clay, with sandstone, such as is usually existent in stringybark scrubby country; but is well suited for apples, pears, plums, strawberries, raspberries, and similar fruits. The locality of course is unsuitable for peach, apricot, nectarine, and trees of the Citrus family.

The are 170 acres in the reservation, which is rather steep hilly, on the banks of the Onkaparinga, two miles from Mylor. Of this, seventeen acres have been fenced, rabbit-proofed, trenched, cleared of stones, &c., and planted on the septuple system, at 12ft. apart, with 5,000 fruit trees and 1,500 small fruits. There are 2,872 different sorts of fruit planted here, comprising:—Apples, 938; pears, 473; quinces, 22; medlars, 3; plums, 253; date plums or kakis, 26; almonds, 19; chestnuts, 3; walnuts, 5; peaches, 222; nectarines, 51; apricots, 74; cherries, 122; Citrus family, 55; figs, 69; mulberries, 5; filberts, 41; olives, 14; currants, 71; gooseberries, 93; raspberries, 49; blackberries, 53; strawberries, 123; grapes, 106. The rows are numbered, and the locality of each plant is indicated, so that anyone can at once find any particular sort or variety which he may desire to investigate. Three separate catalogues have been prepared, and are kept in three separated localities, so that it is practically impossible that all records can be lost. The orchard is at present divided into eight sections, to which others will be added when necessary. The collection will be considerably increased as opportunity offers. It is not intended to cultivate only the desirable sorts, but every known variety of commercial fruit, so that intending cultivators may be enabled to reject worthless or inferior kinds, and select only those which are best suited to their requirements. Much more work could have been done here had funds permitted; but Dr. Holtze must be commended for the large amount of really good work that has been accomplished at so small a cost. The expenditure to date has been as follows:—Labor, £1,249 2s.; material and sundries, £276 5s.; plants, £146 5s.; total, £1,671 12s. The first vote of £250 for the orchard was made in 1897, but the land was not handed over until May, 1898. The vote last year was £800, which sum has been reduced this year to £700. A cheap, but comfortable iron house has been erected for the caretaker, and stables, outbuildings, stockyards, &c., have also been provided out of the above fund.

After a critical inspection of the whole orchard and garden, the party sat down to luncheon, and speeches from the Chairman of the Board of Governors, the Right Hon. Sir S. J. Way, the Right Hon. the Premier, the Hon. Minister of Agriculture, Mr. C. M. R. Dumas, and Dr. Holtze completed the proceedings.

PRESERVATION OF FRUIT.

During the next three months the bulk of our fruit suitable for preservation for future use has to be dealt with, and a few notes on the methods adopted will be of value to those dealing with comparatively small quantities. Full particulars as to the treatment on a commercial scale are unnecessary, as they have been published on several occasions.

The two methods, other than jam-making, of preserving fruit for future use are canning or bottling and drying. Very juicy fruits are preserved better by the former method, but with other fruits, drying is the more economical and also the simpler, besides which less storage space is required. Against this, however, the canned or bottled fruit is always ready for use when required.

The whole success of the operation of canning or bottling depends upon the exclusion of germs causing decay. These germs will not survive a temperature of 160° F. to 170° F., and if the fruit is sealed down in air-tight tins or bottles while at or above this temperature, it will keep good so long as the air is excluded. Tins are considerably cheaper than bottles, and where a member of the household is an adept with the soldering irons, the ordinary preserving tins will be the best to use. Otherwise the self-closing tins or bottles should be used. When the principle involved is borne in mind, the operations are very simple. The fruit is picked while firm—if too soft it will go to a pulp when cooked—packed in the tins or bottles, and a weak syrup, or simply water, added. The bottles or tins are then placed in a boiler of water and thoroughly cooked, care being taken not to spoil the shape of the fruit by overcooking. The lids are then fastened down securely before the fruit goes off the boil. With bottles having screw tops, it is necessary to tighten up the lids as the bottles become cool. The bottles of fruit should be stored in a cool, dark place; strong light will affect the color of the fruit. The addition of sugar does not help in any way to preserve the fruit, the whole secret, as previously mentioned, being to securely seal the tin or bottle while the contents are above 160° F. Before using the bottles or tins they should be scalded and rinsed in clean water, the covers being also treated. Another method, which will, perhaps, be simpler, where only a few bottles are to be done at a time, is to use a large shallow preserving pan, in which the syrup is just brought up to the boil, the fruit placed in it, and cooked for a few minutes, and then placed, boiling hot, with enough syrup to cover, in the cans or bottles and closed at once. In closing the bottles care must be taken to see that the rubber bands fit evenly round the shoulder, and the covers fit squarely on them, otherwise they will not remain air-tight The fruits usually preserved for household use in this way are apricots, peaches, cherries, plums, gooseberries, currants, pears; also rhubarb. Apricots and peaches should be halved and stoned, pears quartered, gooseberries and currants cleaned from stalks, &c., and the rhubarb cut into small pieces; in fact, the fruits are prepared just as if they were to be cooked for immediate use.

When fruit is to be dried for home use it will be done by the heat of the sun in most instances, and not with fire heat in evaporators. The fruit must be left till fully ripe, but must not be too soft to handle and keep its shape. Any flat surface, or iron roof, or sheets of iron can be utilised for drying small quantities, but the best method is to make trays of oregon laths, which can be cheaply made and easily handled. The laths should be nailed to a piece of wood at each end, about 2ft. 3in. long by 2½in. x 1½in., with a strip fastened across underneath diagonally to stiffen the tray, and a light rim round the two sides about ¾in. high to prevent the fruit falling off. The laths should be 4ft. 6in. long.

Currants and Raisins must be fully ripe before they are picked. The former will dry in two or three days in suitable weather. The stalks can be got rid of by passing the dried fruit through a winnowing machine. Table raisins take much longer, about three weeks, to dry. Pudding raisins are first dipped in a boiling caustic solution to crack the skins and hasten the drying process. When dry enough, the raisins can be broken from the stalks by rubbing them over a small sieve, and then passing them through the winnowing machine. This work must be done in the afternoon while the stalks are brittle. Table raisins are, of course, left on the stalks, and handled as little as possible.

Apricots and Peaches must be carefully picked without bruising when fully ripe, but firm enough to keep their shape, cut in half and the stones taken out, and spread on trays cut side up. They will take about a week to dry, and should be taken up whilst warm and packed carefully away from the reach of moths. Fallen fruit, if picked up before the heat of the day and carefully handled, dries very well, and need not be wasted.

Prunes and Plums, if dipped in boiling lye will dry more quickly, but are not of such a nice appearance as undipped fruit. They should not be too dry when put to sweat, and should be turned over two or three times during that process, which will take three or four weeks. If not turned over occasionally they are apt to heat and go bad. Prunes are sometimes dipped, before being packed, in boiling water to which glycerine, at the rate of 1lb. to 20galls., has been added. This gives them a gloss and keeps them soft.

Apples should be peeled and quartered, or cut into rings with an apple-parer, which also takes out the core.

Figs should be beginning to shrivel when picked, and will dry in about two weeks or less in settled hot weather. They should be turned once or twice during the process, and allowed to sweat for ten or twelve days before being packed.

Sweating is a process which all dried fruit must undergo to get a sample of even quality. It consists in leaving the fruit in bulk until the fruit that is rather dry absorbs the surplus moisture from the fruit that has been insufficiently dried. The process usually occupies ten to fifteen days, but plums require a longer time. The sweating should be done in a room where moths cannot gain access, otherwise the fruit will be wormy.

To improve the appearance of most fruit it is usually sulphured before being dried. This makes it of a lighter and more attractive color, but is at the expense of the flavor unless very carefully done. Light will soon cause dried fruit to change to a dark color.

The difficulty with most beginners is to tell when the fruit is sufficiently dried. The most reliable test is by the feel. The fruit is sufficiently dry when no juice can be squeezed out by moderate pressure. Over drying must be avoided; the fruit must be elastic and soft. To secure even drying all fruit that requires more than three or four days to cure must be turned occasionally. This is best done by placing an empty tray over the fruit and turning both with a swing.

SEEDED RAISINS.

Attempts have been frequently made to remove the seeds from raisins by means of machinery, but until within the past three years these have not been commercial successes. In 1896, a Colonel W. Forsyth, of California, initiated a process for removing the seeds which has proved eminently successful, and it appears likely that within a short time a very large proportion of the Californian raisin output will be marketed minus the seeds.

It is stated that the success of the operations depends largely upon the "processing," as it is called, of the fruit. In drying, the raisins are subjected to a dry temperature of about 140° F. for three to five hours, then submitted to a chilling process, and while at this reduced temperature they are passed through a cleaning, or brushing machine, which removes all the cap-stems, dust, &c. The fruit is then exposed to a temperature of 130° F. until cured. It is claimed that this "processing" improves the quality of the fruit, and enables it to keep indefinitely, without being affected by climatic changes. The raisins are now ready to be seeded. The seeding machines, which have capacity of 10 tons to 12 tons per day, consist of rubber, or similar surfaced rollers, through which the raisins pass, causing the berry to flatten out and the seeds to press into the surface; an impaling roller catches the seeds between the impaling teeth affixed to its periphery, removing them from the fruit without any loss of flesh. The seeds are removed from the roller by a whisping device, and finally reach the engine room to be used as fuel.

In 1896, when Mr. Forsyth started his seeding plant, the output was only about twenty-one car-loads, of 10 tons each, and difficulty was experienced in disposing of the product. Last year, however, 450 car-loads were shipped from the Fresno district, and this season the output is expected to reach more than three times that quantity. We believe one of these seeding machines has been imported for use at Renmark.

COMPARISON OF NEWLY-IMPORTED POTATOES.

By F. E. H. W. Krichauff.

In No. 74 of 1898 of the *Landwirtschaftliche Zeitung* I found reports for 1897 on ten of the varieties introduced by me. These, with six others, were planted under the superintendence of the officers of the experimental station of the German Farmers' Association in twenty-six different farms. In looking over the list we must not forget that only from the later varieties a high percentage of starch can be expected.

The land was manured in autumn at the rate of 200cwts. of farm dung per morgen (rather more than half an acre), and with 20lbs. of phosphoric acid in spring; 8lbs. of nitrogen was given in the form of nitrate of soda at planting, and the same quantity after the potatoes were above ground; 1897 was only a fairly good year for growing potatoes, too wet and rainy for the formation of much starch. The average produce per acre was as follows, viz.:—

Silesia, 220⅗cwts. of 19·0 per cent. of starch.
Professor Wohltmann, 219⅕cwts. of 20·6 per cent. of starch.
Hero, 208cwts. of 19·1 per cent. of starch.
Cygnea, 204cwts. of 15·1 per cent. of starch.
Geheimrat Thiel, 196⅘cwts. of 17·3 per cent. of starch.
Sirius, 196cwts. of 19·2 per cent. of starch.
Wilhelm Korn, 193⅗cwts. of 17·3 per cent. of starch.
Max Eyth, 191⅕cwts. of 18·0 per cent of starch.
Pluto, 186⅖cwts. of 18·9 per cent. of starch.
Gratia, 185cwts. of 20·6 per cent. of starch.

Professor Maercker was not planted, as it had already fully established its value.

Professor Wohltmann gave, therefore, most starch per acre, closely followed by Silesia; Hero a good third; Gratia and Sirius about equal, and Pluto, Eyth, Thiel, Korn, and Cygnea following as named. Although Silesia is to be recommended, having shown itself also in 1896 as the most productive, and especially so in strong soil, it is not quite as resistant as Hero and Professor Wohltmann, which are also preferable for cooking. Gratia is even fine, and Pluto and Cygnea good cooking.

Professor Dr. von Rümker publishes the results attained in 1898 by F. Heyne (not marked in the list), of Hadmersleben, and the average from a number of stations for potato cultivation under Dr. von Eckenbrecher (hereunder marked E.). One hundred and eighty varieties were tried, from which (amongst others) he recommends in the following order for cooking and industrial purposes:—

Early Potatoes.—Juli, 202cwts. of 13·9 per cent. starch; Early Puritan, 193½cwts. of 16·2 per cent. starch.

Middling Early.—Geheimrat Thiel, 218⅕cwts. of 21·6 per cent. starch; Ceres, 161cwts. of 23·3 per cent. starch, E. 174½cwts. of 15·8 per cent. starch; Professor Maercker, 202½cwts. of 20·9 per cent. starch, E. 168cwts. of 16·4 per cent. starch.

Late Potatoes.—Silesia, 218½cwts. of 22·2 per cent. starch, E. 222cwts. of 22·4 per cent. starch; Cygnea, 198½cwts. of 19·2 per cent. starch, E. 228¾cwts. of 18 5 per cent. starch.

For Industrial Purposes or Fodder.

Middling Early Potatoes.—Sirius, 172½cwts. of 22·2 per cent. starch, E. 153cwts. of 17·5 per cent. starch; Gratia, 181cwts. of 24·4 per cent. starch, E. 106½cwts. of 18·6 per cent. starch.

Late Potatoes.—Professor Wohltmann, 220cwts. of 23·3 per cent. starch, E. 143cwts. of 17·5 per cent. starch; Hero, 185½cwts. of 23·5 per cent. starch, E. 145cwts. of 16·6 per cent. starch; Max Eyth, 188cwts. of 21·1 per cent. starch, E. 105cwts of 18·4 per cent. starch; Pluto, 191cwts. of 23·3 per cent. starch, E. 105cwts. of 18·4 per cent. starch.

The results are so much better with Mr. Heyne that we must assume he applied far more manure, except for Silesia and Cygnea.

So far as our South Australian experience goes, different soil, locality, and treatment of course gave different results, yet they are worth recording as an encouragement to those who were not quite successful with their first trial at an unusual time for growing potatoes, viz., from January to June. Mr. Hannaford, of Cudlee Creek, with no more than anybody received, had the best crop from the seven kinds presented to him, and he found Professor Wohltmann, Thiel, and Gratia the best cookers.

Professor Wohltmann..	9	sets gave	36½lbs.	Max Eyth	9	sets gave	19½lbs.
Professor Maercker....	12	"	42½lbs.	Wilhelm Korn	8	"	5¾lbs.
Gratia	4	"	22lbs.				
Geheimrat Thiel	11	"	20¾lbs.	Total			164½lbs.
Ehlers..............	8	"	17½lbs.				

On the above varieties I received many reports. Besides Mr. Hannaford, Messrs. Ricks, of Cherry Gardens (who dug 16lbs. from 5ozs), Hutchinson, of Hindmarsh Valley, and Droegemüller, of Lobethal, think Professor Wohltmann as yielding best. Messrs. Feuerheerdt, of Lucindale, and Fischer, of Hindmarsh Valley, praise Professor Maercker as yielding well, of an even size, and growing close to the set. Mr. Feuerheerdt has also 24½lbs. from Gratia; but the tubers spread from the set. Mr. Alex. Wood, of Yankalilla, says:—"Max Eyth was head and shoulders above the rest, having 18lbs. from four sets." Mr. Frank, of Norton's Summit, found Wilhelm Korn the best of the four sorts he received. He had fifty-five potatoes from two sets, weighing 8½lbs. It is most remarkable that I received hardly any reports on the other varieties forwarded elsewhere, and altogether only three returned seed for further distribution, so that I had fall back on those which I did grow, and could not supply many to new applicants. These varieties were Hero, Cygnea, Sirius, Silesia, and Pluto. Mr. J. Grundy, of Second Valley, prefers Hero. He made twelve sets, and had forty potatoes weighing 7lbs. At Mount Compass Hero did remarkably well, having eleven potatoes to each stalk. John Chidlow, near Mount Lofty, was so much taken with Cygnea (and also Eyth) that he desired me to import for him some hundredweights from Germany. Both of them did also well with me in Norwood. Silesia had with Mr. F. Pollard, of Norton's Summit, from two potatoes forty. With me it was the most prolific, and the potatoes very large, quite in agreement with all the trials in Germany. Of Pluto Mr. Pollard had thirty potatoes from two, and I had a grand crop in Norwood, about the size of hen eggs. Sirius did fairly well at Mount Compass, and with myself. Of the varieties Juli, Ceres, and Weisser Schwan received by mail from Mr. Ohrt, in Oldenburg, I cannot yet report, though growing well.

NOTES ON VEGETABLE-GROWING FOR DECEMBER.

By George Quinn, Horticultural Instructor.

On the dry plains country the crops of vegetables which are alone suited to summer heat can be grown.

Plants of the pumpkin and marrow tribe will now begin to spread out and cover the ground with runners. These runners, under favorable conditions, will root into the soil at many of the joints. This habit should be encouraged by lightly mulching the surface with manure. If pressure of water be available, overhead watering by means of "sprinklers" could be practised successfully upon pumpkins and marrows, but care should be taken not to use it—or if the method is used, not to discontinue—during the hottest sunshine. The reason for this is, that as soon as the spray ceases the globules of water concentrate the rays upon the spot immediately beneath, and scalding ensues.

Water, pie, and sweet melons are not improved by overhead watering, more especially if applied constantly in this manner. They are best when watered by under-soakage only. Cucumbers are greatly benefited by overhead waterings, applied either before the sun reaches them in the morning, or after it passes off them in the evening. My own experience on the plains favors soaking the ground in the ordinary manner, combined with morning sprayings.

Tomatoes require staking and tying well up off the soil. It is wise not to apply very much water to these until the plants have set a good few fruits, otherwise rank growth is engendered, and fruit-setting delayed. If time is available the side shoots, devoid of blooms, should be pinched off, but in the commercial gardens this practice is only used upon very early plants.

Cutworms—brown sluggish caterpillars—will probably attack the tomatoes during this month. These pests hide beneath the surface soil in daylight, and come out to eat the plants at night. The bran, Paris green, and treacle mash is an effective remedy. Half a pound of Paris green (Blundell's), 4lbs. treacle, and 30lbs. bran, with a little hot water, would make enough mash for several acres. A lump as large as a pigeon's egg placed near each plant has a wonderful attraction for these pests, and soon lessens their numbers.

French beans of the dwarf sorts, not yielding well, require careful manipulation if production is to be increased. They require abundance of water, and in such a manner as to prevent the plants flagging in the slightest. All pods should be plucked as soon as the seeds begin to definitely form. If seeds are allowed to mature in a couple of pods the plant carrying them will soon cease to bloom. Fresh sowings should be made of both dwarf and runner sorts. I would advise soaking the seeds and covering the surface of drills with broken manure, in the manner so often explained in this column.

The growth of asparagus plants should be encouraged with water and manure, and every effort made to strengthen the root systems, and thus prepare for next year's stem production.

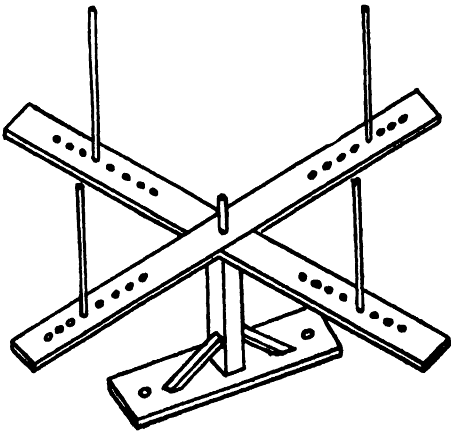
The seed stems should be cut away from beets (not required for seed), rhubarb, parsley, &c.

Sow successional lots of salad plants—lettuces, radishes, cresses, &c., in cool, shady spots.

In the Hills, besides sowings of most summer vegetables, plants of beets, tomatoes, chillies, &c., will be set out into open beds. The surface of the soil between all crops should be finely pulverised and forked or cultivated over after each watering or fall of rain.

REEL FOR FENCING WIRE.

Mr. B. Jaensch, of Murray Bridge, supplies the following simple and handy contrivance for rolling off wire when drawing it, and states he has used it for fifteen years, and finds it a great convenience:—



A short upright 9in. long of 4in. by 4in. sound timber is let into a flat piece 15in. long by 8in. by 2½in, supported by two small stays. The flat piece of wood is bored at each end so that it may be bolted on to a wheelbarrow. The cross pieces are 4ft. long, of 4in. by 3in. timber, in each a row of holes 1in. in diameter are bored for the iron or mallee pegs. The cross pieces are affixed to the upright by means of a centre-pin. The roll of wire is placed on the cross pieces, then the pegs fixed on the inside of the roll; take the outside end of the roll and wire in until the wire is run off.

ON THE TREATMENT OF YOUNG WINES.

Paper read before the South Australian Vinegrowers' Association on the 29th November, 1899.

By Arthur J. Perkins.

This paper has, by special request, been expressly written for our younger winemakers; for those whose experience is as yet limited, and who have to depend for guidance on such information as they are able to glean from the practice of their more experienced forerunners. And here let me pay a tribute of praise to the public spiritedness of those who, after years of struggle with those failures that in time lead perseverance to success, are nevertheless willing to abridge and soften the novitiate of a younger generation springing up around them. Young winemakers cannot be too thankful that trade secrets do not to any extent prevail amongst us, and that those who have acquired experience do not carefully hide it from those who as yet have none. And thus, I am afraid, even to young winemakers, I have nothing to day to reveal that is new. It will be my endeavor to map out and tabulate such facts as are for the most part known to you, giving, where possible, a rational explanation of the various operations, so as to render possible an intelligent and discriminating application of them under the majority of circumstances that are likely to arise.

First let me say, that though in the present state of knowledge it is undoubtedly not always possible to give a rational and scientific explanation of certain mishaps, of what we may call certain diseased states of wines, yet their sources or origin may always be traced to the accidental or careless neglect of some fundamental principle of the art. If not, therefore, always susceptible of cure, they may, with ordinary precautions, practically always be avoided. Winemaking, I may remark, is not the art of doctoring and palming off on the public more or less unsound and ill-made articles, but of so treating and handling wines as to prevent their ever coming within the suspicion of unsoundness. In my opinion, there should be no such thing as the curing of an unsound wine; a wine that is unsound is only fit for the still. It is an art, success in which is mainly dependent on the strict observation of what often, to the uninitiated, appear tiresome and almost useless minutiæ. Under a hot climate such as our own this fact is borne home to us even with greater force than under the cooler climates of the older wine-making countries. Heat is imprisoned energy, capable within certain limits of activating, stimulating organic life, and amongst other things such important alterations as our wines are subject to. We may take it, therefore, that winemaking here is, on the whole, more difficult than in Europe, and that, in consequence, none of the precautions that have been found to be of importance there can be neglected with impunity here

It was to the treatment of young wines that I proposed referring to-day. I shall limit my remarks to such phenomena and operations as, subsequently to the vintage, characterise the first year's work. The new wine leaves the fermenting vat in the thick turbid state familiar to you all. To the palate it is harsh, generally slightly sweetish, and somewhat tart; furthermore, its temperature is relatively high, and it is saturated with carbonic acid gas. I refer to a wine that has undergone a good normal alcoholic fermentation. If at this stage unsound, it will already have acquired those characteristic peculiarities of flavor which in the future only become still more accentuated. During the first year the objects of the winemaker may be summed up as follows:—To get the wine free from matters in suspension, and more or less brilliant in color; to gradually free it from the excess of carbonic acid gas present; to render possible the precipitation and deposit of cream of tartar. Further, the wines must be kept in a perfect state of health and soundness, and as free as possible from foreign odors and tastes. Let us see how, in practice, such results can generally be achieved.

At the very outset we are confronted with the question of storage vessels—a question in itself vast enough, and that we can but hope to lightly skim over in such points as more nearly affect new wines. In what kind of vessels should new wines be stored? I am well aware that in such matters the financial aspect of the question often overshadows all others; and that it is not so much "what is the most suitable storage vessel?" as "what is the storage vessel that I can best afford?" that the young winemaker is often obliged to ask himself. Such a question, therefore, does not admit of any narrowness of definition. The ideal, however, that should be aimed at can always be indicated, and the winemaker, if his finances so order it, can adopt second best or perchance even third best. Should these storage vessels be of wood, or of masonry coated over with cement? So far as initial expense is concerned, cement tanks are, I suppose, the cheaper; they are, moreover, always in good order, and more readily kept clean and in suitable condition for the reception of wines. But there their advantages end; from every other point of view they cannot be recommended for the storage of young wines. Such wines must gradually free themselves during their early days of the carbon dioxide with which they are saturated. Where cement tanks are exclusively used this can only take place, and to an insufficient degree, whilst the wines are being racked. Betwixt wines that are in wood and the surrounding atmosphere are constantly occurring, through the pores of the wood, important gaseous exchanges; the wines give up their carbonic acid gas, receiving in return oxygen that tones down and mellows the wine. There is another important point to be remembered in connection with the retention of carbon dioxide by wine stored in cement tanks. The dissolving powers of the liquid are considerably raised thereby, and an inconveniently large proportion of cream of tartar remains in solution, and the wine continues depositing at a later period to the extreme inconvenience of the maker. In fact, the storage of young wines in cement tanks prolongs indefinitely their development and maturing, and we may conclude therefrom that their adoption is not to be recommended for such wines.

We cannot, unfortunately, leave this question of storage vessels at this point. Of wood vessels there are two types--what we may term the straight vat, and the cask-shaped vessel. As a matter of expense the vat is evidently the cheaper of the two, but is it as good as the cask? In my opinion it is not. The main objection to the vat is that in it, as the wine evaporates, it leaves exposed to the action of the air a dangerously large surface; and that further, unless of perfect construction and seated on an almost perfect level, it is practically impossible to fill it completely. These difficulties it has been sought to overcome (with what measure of success I am unable from personal experience to say) in two different ways. In one case the upper head of the vat, instead of being flat, has been domed; and in the other a glass reservoir full of wine, and in open communication with the vat, has been fitted in through the bung hole. I will merely state that in my opinion in the domed cask all principles of good construction have been violated, which can but augur badly for the number of years that they will continue in use. In fact, to my mind the cask remains immeasurably superior to the vat, however much improved.

The nature of the wood that is thus brought in contact with the wine is also of importance. The wine will act as a solvent, and, by osmosis, withdraw from the wood what of soluble matter it contains. Such soluble matters may remain harmless, or else they may injuriously affect the wine; they rarely, if ever, can have a beneficial action on it. All resinous woods, all woods rich in essential oils must from that fact be avoided. Throughout the world oak is the only wood that has received any extensive patronage for wine casks. It is somewhat unfortunate that it is not reared here, but that we have to rely on Europe and America for our ordinary supplies. Our hard woods have been tested by various makers—jarrah, redgum, karri, &c. I have not yet, however, been able to gather any very unanimous vote in their favor, and I do not anticipate that they will ever enter into very general use.

But even oak contains soluble matters liable to affect the wine, more particularly American oak, of which, in my opinion, we make too free a use in our cellars. In Europe it is frequently the practice to place new wines in unseasoned casks with a view to preparing the latter for the reception of more advanced vintages. But then for such practices American oak is practically unknown to them ; it is, however, hardly a commendable practice, even in the case of the better European oak. It is not the tannin that is dissolved that is objectionable ; the latter, if present in excess, can readily be removed by subsequent operations: but the essential, or aromatic oils, it is practically impossible to remove from a wine. The latter remains permanently disagreeable and woody. The American oak appears to be particularly rich in such oils, and any amount of seasoning does not appear to thoroughly cleanse it. From the above considerations I am of opinion that it is extremely unwise to place even young wines in unseasoned casks. A strong brine is usually recommended for the purpose. My experience of this practice is, however, far from satisfactory. However strong the brine, it will never keep sweet for a sufficient length of time to have any appreciable effect on the wood. To constantly renew it would render the process extremely expensive. Personally, I much prefer a caustic soda solution, at the rate of 1lb. to 1½lbs. to the 100galls., followed on by a dilute sulphuric solution—about a wine-glass-full to the 100galls. A week of each treatment is generally sufficient to remove most of the objectionable matters from the wood.

At a later stage, when the cellars themselves have acquired more age, the new wines will of course be received in storage casks that have become thoroughly seasoned by contact with previous vintages. Needless to say that such casks should be perfectly clean, sound, and free from bad odors, or anything that is likely to taint the wine. Should the wine that they had previously contained have been of unexceptionable soundness and quality, it will only be necessary to rinse them out with cold water, allow them to drain, and subsequently sulphur them regularly until required again. If, however, there existed any doubt as to the soundness of the wine that they had previously contained, after thorough cleansing and preparation the casks should be completely sterilised by steam.

So much for the storage vessels. The new wine that they receive has still to undergo what is known as the silent fermentation, during the course of which what still remains of sugar is definitely and finally converted into alcohol. Winemakers have every interest in promoting the course of this fermentation. If checked at this stage the wine remains sweetish, and a second fermentation is, with the return of warm weather, liable to set it again in spring. Such a phenomenon is far from desirable; at best it spoils the condition of the wine, rendering it more or less turbid in spite of winter working ; at times, however, it has even more serious and lasting effects on the wine. As much as possible, therefore, fermentation should be completed before the advent of cold weather. From this point of view it is not advisable to run new wines into sulphured casks, as in some cases the gas would more or less completely tend to check fermentation. Casks that had been previously sulphured should, therefore, be well rinsed out with water and aerated before receiving the new wine. Nor should the new wine from the outset be stored in a very cold cellar: brusque changes of temperature are also liable to arrest fermentation. The temperature of the cellar that receives the new wine should be, approximately, that of the fermenting chamber.

In view of this so-called silent fermentation, and the consequent slow production of carbon dioxide, the casks cannot at first be completely bunged down. And yet it is advisable to screen the wine as much as possible from too immediate contact with the surrounding atmosphere, whilst allowing at the same time for the escape of the gas. Hence the practice familiar to you all of placing over the bung-holes small sand bags, that fulfil the purpose very well. So long as fermentation continues, and the vacant space betwixt the wine and the sand bag remains saturated with carbon dioxide, the wine is perfectly safe. As soon, however, as there is no further evolution of gas, atmospheric gases, oxygen amongst them, tend more and more to occupy the vacant air space, and the wine, unless taken in time, is in danger of acetification. Fermentation completed, therefore, the casks should be carefully filled, and at first bunged down loosely. Should no further signs of fermentation appear during the course of the following day, the casks may be sealed down hermetically. For some time after, however, more particularly on sudden returns of warm weather and north winds, it will be necessary to watch these casks, and ease them off should any new movement declare itself in the wine.

With regard to bungs and the sealing down of casks I may be allowed to say a word. The old practice consisted in using a flat cork or wood bung, surrounded by a piece of cloth in order to ensure a more perfect fit. This practice cannot be too strongly condemned; the cloth is more or less in contact with the wine, which by capillarity it draws to the surface, where the latter undergoes partial acetification, to the great danger of the wine. Further, the use of bung-starters, necessary to withdraw these bungs, disturbed the lees, tending to render more or less cloudy an otherwise bright wine. The conical bungs or plugs of hard wood that are used in most of our cellars are far preferable. I may say, however, that personally I object to the shape generally given to them; these plugs are made to plunge by nearly half their length into the liquid. In my opinion they should be so made as to penetrate into the cask to a depth equal only to the thickness of the staves, remaining internally flush with the latter. If the bung be allowed to penetrate into the wine it is practically impossible to properly fill the cask, as the exact space occupied by the bung can only be more or less accurately guessed at. Further, a bung projecting beyond the cask by the greater part of its length is much more readily removed without disturbing the lees than a bung plunging deeply into the liquid.

However good the fit of the bung, it is extremely difficult to make a hermetic joint of it by mere insertion. I think, therefore, that the fixing of the bungs should, as is already the practice in many of our cellars, be followed by the application over the edges of the bungholes of a closely adhering circle of specially prepared fat and plaster of Paris, to which may be added a little salicylic acid to forestall any possible decomposition of organic matter.

For some time after the first filling up the casks require very careful and frequent visiting. Fermentation over, the wines cool down and contract. There is, therefore, the formation of a considerable air space beneath the bungs. To avoid the danger of leaving the casks on ullage, they should at this stage be filled up about twice a week. Later on, when cold weather has definitely set in, once a week for small casks and every other week for large casks will be quite sufficient. Apart from constant filling up, the wines may now be left to themselves until midwinter. Under the influence of rest the heavier matters in suspension gradually settle at the bottom of the cask, where they form the gross lees. It is off these lees that the wine that has become considerably brighter should be racked in June. There was at one time prevalent an old superstition to the effect that the lees nourished the wine, and that they should be left in contact with it as long as possible. A more erroneous idea could not be imagined. The lees are formed of matters eminently liable to putrefaction, and the sooner the wine is removed from contact with them the better. In its new casks the wine will remain undisturbed until the return of warm weather—that is to say, until September—when it should be racked a second time. Betwixt the first and the second racking should take place the deposit of the finer matters in suspension. Their complete precipitation is hastened and rendered more perfect by the prevailing low winter temperature On the whole the more young wines are brought under the influence of low temperature after the completion of their silent fermentation the brighter will they become. The cold weather should also render all but complete the precipitation of the excess of cream of tartar, whilst the escape of carbon dioxide will only be slow and gradual.

As winter gradually dies out, the general rise of temperature that calls into leaf our deciduous plants, and amongst them the vine, makes its influence felt in the cellar. Wines, and particularly young wines, begin to show signs of movement, and, unless they are racked off their lees, lose much of their winter brilliancy. This movement that is apparent in wines is caused either by the expansion of existing gases or by the generation of new ones in a second fermentation. In the first instance we are dealing with a purely mechanical phenomenon, the influence of rise in temperature on gases still in solution in the wine; in the second it is the calling back to life of dormant yeast cells that set about decomposing what little sugar there still remains. Whatever the cause, the spring movement will always show a tendency to disturb the lees, and it is therefore advisable to forestall such an accident by racking the wines before the appearance of these spring phenomena. At this time of the year it is frequently of advantage to run the wines into slightly sulphured casks; the gas will generally tend to put a check on the development of any fermentation.

At this stage the wine should be almost completely bright, and it should be remembered that it is always extremely dangerous to allow a wine to reach the summer months in a more or less cloudy state. It may be taken as a general rule that a sound and well made wine will always be bright of its own accord by September. A cloudy wine is always a defectively made wine, which it is often extremely difficult to get into condition. The actual causes of cloudiness are extremely numerous, and the time at my disposal does not permit of a detailed examination of this question; roughly speaking, it may be said to be due either to specific bacterial diseases, or else to faulty composition of the wine. If incipient disease is the cause, and the wine not sufficiently far gone to be condemned as unsound, before any other treatment complete sterilisation of the liquid is first necessary; the wine must either be fortified or else pasteurised. Such treatments are frequently sufficient of themselves to clear the wine; if not, they should be followed by an energetic fining or careful filtration. If it is the composition of the wine that is the stumbling block, after due determination of the fact, efforts should be made to correct the fault. In may be deficiency in tannin, in natural fixed acids, excess of albuminous substances, &c. I repeat, however, that the origin of such mishaps must be traced to the earlier stages of manufacture, where careless or accidental neglect, or defective vintages are the initial causes of the trouble.

Should wines be fined during the course of the first year or not? A question that a young winemaker may well at times ask himself. In reply, I would state that if in the month of August the condition of the wine continues unsatisfactory, it would be wiser to do so. From the general point of view it is a rather debatable question, the solution of which, to my mind, depends a good deal on the intending purchaser of the wine. If the wine is for sale to local London buyers, who appear to be on the look out for the fullest and thickest of wines, I would say do not fine the wine unless absolutely driven to it. If, on the other hand, the wine is intended for the London Depôt, from whence wines are disposed of to consumers in the condition in which they are received, I would say that a light fining can do no harm, and will do much good in polishing up the wine. On this question of fining I need not enter into further details, as I have already on a previous occasion had the opportunity of addressing you on the same subject.

During the summer months the wines should be kept as much as possible at an even temperature, but not necessarily at a very low one; an average temperature of from 68° to 72° F. will generally prove very suitable. During the rest of the season the wine will continue depositing, and by vintage time should have practically freed itself of any excess of carbonic acid gas, and with it of its taste of young wine. During the warm weather the filling up of the casks should be attended to with the greatest of care; small casks should be visited twice a week and large casks once a week. Barometric depressions, with their attendant north winds, generally cause wines to swell out, and in order to avoid accidents a certain amount of wine should be withdrawn from the casks, and replaced as soon as any signs of contraction become apparent. Young wines should receive two more rackings before the opening of the new season—one in November, and another immediately before vintage time. And thus, with this latter operation, we conclude the treatment of young wines.

I do not pretend, gentlemen, to have done anything more than give a very rough outline of important questions of interest to young makers; to have treated the matter in greater detail would have necessitated too great an encroachment on your time. I hope, however, that the paper, such as it is, will be of use to those for whom it has been more specially written.

FARM HINTS FOR DECEMBER.

By the Editor.

"Trust in Providence, but keep your powder dry," is a motto for every farmer who owns live stock. Our seasons cannot be depended upon for supplies of natural fodder, therefore a large portion of wheat and other straw should be saved whenever the opportunity occurs. Wheat straw is of its greatest nutritive value when the grain is in the dough stage, and the longer it stands in the field after this the less nutritious it becomes, until at last it consists almost entirely of vegetable fibre, having lost its oil, sugar, starch, gum, aroma, and other desirable properties. The grain suffers similarly, but to a lesser extent in some particulars.

Nothing more is now required to prove the fact that selection and reselection, year after year, of the finest seed-heads of any kind of cereal, of those giving evidence of high quality, will result ultimately in the development of a grain of great value; but many farmers, in the hurry-skurry of harvesting their crops, lose sight of the necessity to select from the ripening fields such ears or heads that show a decided superiority over the average—such as earliness, strength, heavy yields, good milling quality, resistance, &c. By selection, and reselection from selected seeds, nearly every really good plant in cultivation has been produced, and without selection, nearly all of our cultivated plants—and animals too—will deteriorate. Select several best representative heads, and cull out until only one or two of the very best remain; propagate from these next season; select again and again until something of the highest character has been secured.

Where hay has been mown or the stringbinder has been used it will be worth while at the earliest opportunity to run heavy harrows over the fields. This will break up the caked surface, cover some of the scattered seeds, let in air to mellow the soil, and allow the early rains to soak in, so that weeds and rubbish will germinate and afford an early bite of green stuff for the stock. Such land will probably be in a fit condition for early fallowing, whilst other fields will be too hard to allow of being turned over. No doubt the teams will work it with less labor, and the soil will be in a better condition for the production of a crop.

Crops of maize, sorghum, holcus, millet, mangolds, beets, kohlrabi, kail, potatoes, &c., must be frequently cultivated in order to make sure of best results.

To guard against fire, spaces should be ploughed around stacks, buildings, and crops, and, wherever practicable, lucern, or some green summer or autumn crop should be grown there. Firebreaks should be mowed through standing crops, and plough furrows run, to stop fire destroying the whole crop should one unfortunately break out. Wide spaces should be cleared around floors, and all the spoil from the strippers should not be placed upon one floor. Every farmer should also make all preparations to fight fire. It is too late to "prepare" after the fire has started.

Although it is rather late, it may be worth while in the cooler and later districts to sow a few acres of well-prepared fallow land with maize, sorghum, millet, or some similar crop, for green feed. Soak the seed forty-eight hours before sowing, sow in drills, roll, and cultivate often.

Pumpkins, piemelons, &c , will not grow well until the general average temperature is about 80° F. all the time. It is not too late to sow seeds in deep light soil, well fertilised with old cowyard or sheepyard manure. Soak the seeds twenty-four hours; sow at least a dozen seeds in each spot, at 15ft. apart; thin out all but three of the strongest plants in each place. To prevent the runners being shifted by the wind, or other causes, sow some maize thinly over the ground.

Whilst horses are working, feed with nourishing stuff three times a day, but do not give more than each animal will eat up at once. Corn is necessary to keep working horses up to their work.

Stacks should be thatched as early as possible. It will not be pleasant to have to take down, dry, and rebuild if rain should occur.

A very large percentage of seed harvested with the stripper gets crushed in the operation, and fails to germinate when sown; therefore, it is desirable that seed should be reaped and thrashed, or rolled out. The best and cleanest crops should be selected now for seed, and this should be most thoroughly cleaned from drake, oats, and other foreign seeds. Mark the bags in which the seed is placed, so that no substitution can be made by accident.

Large losses are occasioned every year through live stock of all kinds being unable to find shelter from the fierce heat of the sun. Even if the birds and other animals—horses, cattle, sheep, pigs—do not die from the exposure, their health is injured. It is neither difficult nor expensive to provide some sort of shelter in the paddocks and around the homestead, for stock and implements.

If any geranium, native clover, or any other kind of green succulent fodder is available, it will make excellent silage when placed in alternate layers of 1ft. in thickness with straw, "cocky chaff," or with chaffed straw or hay. Kail, cow cabbage, beet, or mangold leaves, and similar fodders have often been used in this way with very satisfactory results.

Loose Tires.—Loose tires can be prevented by cleaning off old paint on the felloes, running the felloes in boiling water for an hour, then running in hot linseed oil till the wood will absorb no more. The hot water causes the wood to swell, and the water afterwards gives place to the oil, which fills all the cells and prevents the wood shrinking again.

THE MICE PLAGUE.

It will be interesting to farmers to learn that, by means of a bacillus, fields swarming with mice have been cleared of the pest. In the *Queensland Stock Report* the following extract from the report of Mr. C. J. Pound, Director of the Stock Institute, points out what has been done, and what may be done, to rid the country of the mice plague without injury to other animals:—

BACILLUS TYPHI MURIUM.

This pathogenic bacillus, which I have had under cultivation and observation for some considerable time, has been brought somewhat prominently under notice during the last few years, principally by Loeffler, who recommended that the bacillus might be of use for the destruction of field mice.

In Italy, Greece, and the south of Russia the results attending its use have been highly satisfactory.

Loeffler has succeeded in ridding fields (so infested as to be useless for agricultural purposes) by saturating some bread with broth cultures of the bacillus and distributing it near the holes inhabited by the mice.

The bacilli that were eaten by the mice not only killed them, but also infected others which ate the dead bodies of the first victims, and so the extermination progressed until scarcely a mouse remained in the fields.

The bacilli are not pathogenic for animals such as cats, dogs, ferrets, &c., that feed on mice, and they (the bacilli) do not affect man in any way, consequently this micro-organism should occupy a useful place in agriculture by destroying those small yet extremely prolific rodents, which not only destroy some of the grain by gnawing, but taint considerable quantities with that odour which is peculiar to mice.

Some time ago exhaustive experiments were carried out to test the effects of this micro-organism upon flying foxes, but, in consequence of the difficulty of infecting the natural food of these animals, the results did not come up to expectations, although the bacillus was proved to be virulent and fatal to each animal that was specially fed with even the merest trace of an active growing cultivation.

Experiments with Laboratory Mice.

In view of the frequent applications from various farming centres on the Darling Downs, and from different agricultural districts in New South Wales, for some method for the destruction of mice in granaries and wheat stacks, I have been experimenting with the bacillus Typhi murium on mice, first by inoculation, and then by feeding, afterwards placing healthy or control mice with experimentally-infected ones.

Just as Loeffler pointed out, when the specially fed or inoculated mice died, they were eaten by their companions, which also contracted the disease, and in due course died, notwithstanding that an ample supply of various kinds of food was always kept in the cages.

Mice that are inoculated subcutaneously usually die in from seven to twenty-one days, while those which are fed upon the material containing the bacillus succumb, as a rule, between the twelfth and twentieth day.

The bacilli multiply fairly rapidly within the blood vessels, and cause death from general septicemia, or blood poisoning.

WEATHER AND CROP REPORTS.

Booleroo Centre.—Haymaking is about finished, though carting has been delayed by the rough weather. Yield will average about one ton per acre. The early wheat is about ripe, and has been somewhat knocked about. This district will probably average about 8bush. Locusts are very numerous and are travelling southwards, doing a lot of damage to feed and gardens.

Balaklava.—Haymaking is about finished, and stripping has commenced. Some wheat crops were badly cut by frost, scarcely a sound grain being left in acres of wheat. Heavy thunderstorms have renewed the water supplies, and stopped carting. The wheat yield is not likely to be nearly so good as last year.

Dawson.—Reaping is in full swing. Locusts have done considerable damage to both wheat and feed, and are now clearing the gardens. Except in the track of the hailstorm, the hundred of Coglin should average 5bush. per acre. Stock are falling off in condition.

Gawler River.—The changeable weather has retarded harvesting operations. The season has not been altogether favorable to good results from fertilisers, especially bonedust; but still the manured crops are far superior to the unmanured. Early fallow drilled in and manured will yield best. Haymaking is finished, and the crop nearly gathered. Feed is getting scarce. Gardens are looking well, and the grape crop will be good. Rainfall, three weeks, November, 1·71in.

Hartley.—Crops have suffered severely from dry weather, especially the late sown crops. The district will probably average 5½bush., though a good many early crops may go 8bush. Manures have not been largely used, though much of the land is badly in need of some. Rainfall, October, 0·69in.; November, to 15th, 0·85in.

Hindmarsh Valley.—Favorable weather for gardens and summer crops continues; feed is unusually abundant, and the potato crop promises to be good. Most fruits are fairly plentiful, but blue mountain parrots have already appeared, and the cherries have been cleared off the trees before properly ripe. This is considered to portend lack of food in the scrub, as during good honey seasons these birds do not show themselves, whereas at other times they come in hundreds, and strip everything. Haymaking is general, but has been much delayed by wet weather. Rainfall for three weeks in November, 1¾in.

Inkerman.—The weather for the past month has been very variable and generally cool. Rainfall, 1·45in.

Kapunda.—Haycutting is about finished, but the crops are not so heavy as last season. The wheat crops have been greatly improved by the the cool showery weather during the past few weeks. Grass is dry, but stock are looking well. Rainfall for October, 0·8 in.

Koolunga.—Reaping is now general. Operations, however, are retarded by the frequent cool changes. Crops have matured splendidly, and the sample will be good. Results will probably be better than was expected a little time since.

Morphett Vale.—Fair late rains have been experienced, but they were too late for most crops, which were already running to ear. The hay crop in the south is the lightest for many years. Vines are looking healthy, and look like giving an average yield.

Mount Compass.—Rainfall for three weeks of November, 2·11ins.; for year, to date, 30·30ins. Slight frost cut a few potatoes on the 22nd. Feed is plentiful, and stock are looking well.

Murray Bridge.—Weather of late has been extremely variable, being from very hot to cold and windy, with fair amount of rain, 1·40in. being recorded already this month. Crops vary from good to very bad. Reaping has commenced, and some good returns are being obtained, the samples going 65lbs. to the bushel.

Nantawarra.—Stock of all kinds in good condition. Most farmers have started reaping, but not much has been done owing to unseasonable weather Cannot as yet give estimate of yield. Rainfall to date, 9·65in.

Saddleworth.—The hard frost of October 25 not only severely cut vines and fruit trees, but damaged hundreds of acres of wheat, now being cut for hay. Late crops, checked by the frosts, have lately suffered from the hot winds. The hay crop will be light. Feed is getting very short. Rainfall this year to date, 12·58ins., this is 6ins. under the average.

Wilmington.—Reaping is now in full swing, sample being very good. The average yield is estimated at 8bush.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— November 30, 1899.

The remarkable feature of this season so far has been the occurrence of unusually severe frosts, continuing even until a few days ago. The damage to potato and kitchen vegetable crops near Adelaide has already been noticed, and from the vine and orchard districts reports are now being received of great havoc from the same cause, so that the output in these will be light. Many blame also the recurrent frosts—apparently with some show of reason—with causing growing feed this season to fade off earlier than usual, notwithstanding the very cool spring time. Hay crops are safely gathered in most parts, whilst grain reaping is in full swing in earlier districts. The further advance in the value of wool is putting great heart into sheepfarmers.

In commercial circles there is a sound ring, a generally healthy condition of the producing interests, giving a feeling of confidence. Although the mining share market has been a bit sick, the cause of which has been attributed to the Transvaal war; there is, however, good healthy development shown in the opening up of minerals in our colony.

In the grain trade a very dull month has been experienced. This, however, is not unusual for November, when there is generally a feeling of uncertainty prevailing as to the probable results of the harvest being reaped. In wheat, prices have steadily declined during the month, until they are lower now than was expected, owing to weakness shown in European values. Locally, very little trade has been passing, exports being practically nil; buyers have been operating but little, whilst sellers have not shown any inclination to quit, there being amongst holders, in spite of the weakening market, a feeling that prices will be better later on. Flour has eased in sympathy with wheat. In forage lines hay is unchanged, although new is offering freely. The quantities cut this season, it is reckoned, will not be more than two-thirds of that of the previous year. Feeding grains are somewhat weaker than when last reported.

The miserable yield of early local potatoes, judging by the quality and smallness of sample, has compelled dealers to continue importing old season's from Victoria, a most unusual course of trade thus late in the year; but, although the locals are so very poor, the scarcity keeps prices relatively high, consumers as usual showing strong preference for new, notwithstanding the very great difference in price. Locally-grown onions are supplying the market, and although in this also the yield is very light, the samples that are coming forward being mostly the "silver-skinned" variety, only fit for immediate consumption; values have weakened.

A full month's trade has been put through in dairy products, but towards the end there was a marked diminution in supplies coming forward, caused to some extent by the early drying off of feed before referred to. London values of butter giving way affected this market, but not to the extent that might have been expected, strong intercolonial and Cape demand absorbing all offering. Decreasing shipments to Europe may now be expected, with the probability of local demand overtaking supply by Christmas time. Larger quantities of eggs are coming in, causing prices to rule somewhat lower than during several seasons past, but the increased numbers will, it is expected, compensate for the lower rates. Our Western neighbours continue to be our chief export buyers, although the Barrier District also figures well in this line The market at moment is firm at prices quoted a month ago. A more seasonable trade has been doing in cheese, without any quotable alteration in price. The comparatively low rates ruling for bacon, causing increased exportation, stocks have been reduced, and any alteration in price in this line is likely to be in an upward direction. Supplies of new season's honey are beginning to come forward, for which there is good demand. Beeswax finds ready quittance. Almonds have continued very scarce.

Supplies of poultry have been fairly good at the auction sales from week to week, and prices have well maintained.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 7½d. to 2s. 8d.; old, 2s. 9d. per bushel of 60lbs.

Flour.—City brands, £7 to £7 5s.; country, £6 10s. to £6 15s. per ton of 2,000lbs.

Bran, 8¾d.; pollard, 8¾d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 7½d. to 1s. 9d.; good stout white, 2s. 4d. to 2s. 6d. per bushel of 40lbs.

Barley.—Malting, nominal; Cape, 1s. 9d. per bushel of 50lbs.

Chaff.—£3 5s. to £3 10s. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Local, new, £6 10s. to £7 10s.; Imported, old, £3 10s. to £4 10s. per 2,240lbs.

Onions.—£3 10s. to £4 per 2,240lbs.

Butter.—Creamery and factory prints, 8d. to 9d.; bulk, 8½d. to 9d.; dairy and collectors' lines, 5½d. to 7½d. per pound.

Cheese.—S.A. factory, best, 6d. to 7d.; ordinary to fair 4½d. to 5½d. per pound.

Bacon.—Factory-cured sides, 6¼d. to 6¾d.; farm lots, 5½d. to 6d. per pound.

Hams.—S.A. factory, scarce, 7½d. to 9½d. per pound.

Eggs —Loose, 6d.; in casks, f.o.b., 7½d. per dozen.

Lard.—In bladders, 5d.; tins, 4d. per pound.

Honey.—New, 3d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 5d. to 5½d.; kernels, 1s. 2d. per pound.

Gum.—Best clear wattle, 2d. per pound.

Live poultry.—Fine table roosters selling at 1s. 7d. to 2s.; good hens, 1s. 3d. to 1s. 6d.; ordinary roosters and medium hens, 1s. to 1s. 2d.; ducks, 2s., and up to 2s. 8d. for weighty birds; small and medium, 1s. 9d. to 1s 11d.; geese, from 3s. to 3s. 9d.; pigeons, 6½d.; turkeys, 4¾d. to 5¼d. per pound for fattening sorts; table birds from 6½d. to 7½d. per pound live weight.

YOUNG HENS FOR EGG PRODUCTION.—At the Utah Agricultural Experiment Station some interesting experiments have been carried out, proving again that pullets are the most profitable layers. One pen of four Brown Leghorns as pullets averaged 181¾ eggs per fowl at a food cost of 2s. 7d.; the following year, with similar treatment, the same fowls averaged 114·2 eggs at a food cost of 2s. 9d.—less eggs and more feed. Another pen of three pullets of the same breed made a record of 157¾ eggs at a cost of 2s. 6½d.; the following year they averaged 150·8 eggs at a cost of 2s. 7½d. This shows a considerable difference in favor of the pullets in the first pen, but not to such an extent as the other pen. The pullets' eggs averaged somewhat less in weight than the older birds.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, NOVEMBER 22, 1899.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, K.C.M.G., Messrs. Samuel Goode, W. C. Grasby, M. Holtze, T. Price, M.P., T. B. Robson, W. F. Snow, C. J. Valentine, and A. Molineux (Secretary).

Conferences.

The SECRETARY reported that during February, 1900, the following Conferences of Branches were to be held:—Far Northern, at Quorn, on February 16; Northern Yorke's Peninsula, at Bute, on February 21; River Murray Branches, at Mannum, on February 27; and Northern, at Gladstone, on date to be fixed.

Finances.

Some discussion took place on the amount placed on the Estimates for the expenses of the Bureau for the current year, and it was resolved "That the Bureau places on record its regret that the estimates for contingencies have been reduced, and respectfully informs the Minister that if an excess cannot be obtained important work will have to be omitted, and the influence of the Bureau will suffer."

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

321. *Do heavily manured crops suffer most from drought?*—Undoubtedly this is the case with farmyard dung, and where superphosphate *alone* has been applied. With potash salts it does not take place, and certainly not where the cheaper raw potash salts are used, which favor the retention of moisture in the soil. In general it can be asserted that fields that are heavily manured, but in the right proportion of the three plant foods, withstand drought better than those which are unmanured, or with small quantities. It may occur that the reverse has been observed, but the reason for this is probably that the crops were not in the same state, the last mentioned fields being backward, while the heavily manured crop was already flowering at the time of great heat and temporary drought.

322. *To catch Codlin Moths.*—The glasses filled with a solution containing apple jelly have not been very successful here in consequence of the heat, which dries the solution too quickly. Financial Counsellor von Heinemann, of Brunswick, has now proposed another remedy, which seems better for our climate. With him and many others it has been a complete success. Dried apples are put in form of wreaths on strings, mostly six to eight pieces on one. These are dipped in a bath of honey and water, and receive thereafter some "ether of apples or pears." You can catch most with sheet lightning, and least in rainy weather.

323. *The Serum Treatment of Swine Plague and Hog Cholera*, by E. A. de Schweinitz, Ph.D., M.D.—It was prepared from cattle, horses, mules, donkeys, that received injections of the filtered, sterile, or live cultures of the hog cholera germ and swine plague germ, or the solutions of their products, including cell contents, extracts, and secretions. The injections were made either subcutaneously, intravenously, or intraabdominally, or a combination of two or more of these methods; commencing with small quantities very carefully, and increasing the injections gradually until large ones could be injected. Up to six or eight months the serum becomes sufficiently potent to check the motility of the hog cholera germ, and guinea pigs inoculated with it or the swine plague germ die in seven to ten days. The quantity of the serum used for treating pigs weighing from 40lbs. to 60lbs. is 10 c. c., or more when heavier. It being almost impossible to determine at once in the field whether animals are suffering from hog cholera or swine plague, it would be well to treat them with a curative serum mixed for both diseases. The animals treated should have proper care as to food, water, housing, and cleanliness. In 1897 about 82 per cent. of the animals treated with the mixed serum, viz., 161 out 196 were saved, out of which about 50 per cent. were ill at the time the injection was made. In herds in the neighborhood which were not treated only 15 per cent. recovered. The serum reduced the mortality therefore about 67 per cent. The animals began to improve very shortly after the injection. In 1898 thirty-five herds containing 1,727 swine were treated, of which 403 died. In thirty-three other herds with 3,197 swine, in the neighborhood, which were not treated, only 600 survived. It is estimated that the State of Iowa alone loses fifteen

millions of dollars yearly through the death of hogs from the above diseases, and eleven million dollars of this loss might be avoided by injection. The cause of infection can be carried from one farm to another by animals, by birds, by water running through several farms on some of which the disease exists, and by the farmers themselves visiting the pens and lots where their neighbors have sick hogs. Disinfection with lime or 5 per cent. carbolic acid of the premises, of the farmers' boots, clothing, of the wagons, &c., are absolutely necessary, and the hogs should from time to time have access to a mixture of salt, sulphur, and charcoal, or it should be put in their food.

324. *Photographing Results of Manuring.*—It is necessary to mow the outside of any crop until you have reached the normal state of it. You should then fix at the back, not too far distant, a lighter or darker cloth, as may be demanded by the color of the crop (or trees if their crop is to be taken). It is also desirable to put a scale for measuring the height into the crop, to be photographed with it, and also in the unmanured crop. It is afterwards usual to place the two photos. side by side for comparison. I have before me such photos. of crops manured with greater or lesser quantities of manures, together with the comparative grain obtained after thrashing, in show glasses, which make the great difference more apparent, where none or more or less of the manure had been applied. The results of experiments of 1/40 of a morgen (calculated at per Prussion morgen, something more than ½ acre) were, without manure, 4·80cwts. of wheat and 10·80 cwts. of straw; with 2cwts. of kainit and 1cwt. of nitrate of soda, 8·40cwts. of wheat and 14 40 cwts. of straw; with the addition of 2cwts. of Thomas phosphate, 11·20 cwts. of wheat and 21·00cwts. of straw; with 3cwts. of Thomas phosphate, to 12·40cwts. of wheat and 22·80cwts. of straw; and 4cwts. of Thomas phosphate increased the crop to 14 40cwts. of wheat and 26·20cwts of straw. These experiments seem to show that the application of more than 2cwts. of Thomas phosphate will hardly pay for the wheat crop, but the surplus of the phosphoric acid is not lost. It remains in the soil ready for future crop.

325. *A Monster Calf.*—At the Berlin show a calf of the Oldenburg breed weighed no less 348lbs., although only 2 months and 18 days old.

326. *Scabby Potatoes.*—Remedies against this fungus are muriate of quicksilver (quicksilver chloride) of a 0·1 per cent solution, of which 100gr. are diluted with 175 pints of water. In this the potatoes are left one and a half hours, and afterwards put for some time in clean water. The potatoes must not show their shoots. Others, who ascribe the disease to fresh stable dung, or at all events to an excessive manuring with a nitrogenous manure, recommend the use of a 2 per cent. Bordeaux mixture four weeks before planting the potatoes The potatoes used for seed should not show the disease in any case. Excessive moisture, and potatoes not hoed will show the disease more.

327. *Experiments with Potatoes at Chiswick and at the Wisconsin Agricultural Station.*—At Chiswick it was intended with sixteen varieties in alternate rows to test—(1) The difference between earthing and non-earthing; (2) the rubbing away of all sprouts and the careful preserving of all sprouts. In the whole of the sixteen varieties there was absolutely no difference apparent, either in the size of the tubers or the weight of the crop. The only difference was that those tubers planted without sprouts were a little later in maturing their crops. At Wisconsin Mr. E. S. Goff inquired into the conditions affecting the starch contents of the potatoes of the same variety, and in the same season. Variation in starch is not due to the difference in size of the tubers, nor in a trial reaching through two generations was any hereditary influence discernible. But in six different varieties it was found that in the deeper growing tubers in every case the specific gravity was greater, those nearer the surface in the same hill being lighter. Mr. Goff explains this to himself through the temperature of the soil, the deeper tubers being in a cooler medium. As regards hilling up, the tubers contain less starch, as the soil, when hilled, is warmer in warm dry weather than that which is not hilled. But he suggests mulching during the formative season of the tubers as a means of increasing starch in localities where there is a hot and dry summer. What to me seems most remarkable is that the yield of merchantable tubers and the specific gravity *increased* as the distance between the hills *decreased*. The difference between 3½ft. x 3½ft. and 3½ft. x 1ft. was as 16 per cent. to 17·3 per cent. This is certainly in accord with the before-mentioned observations, and, if we take it for granted that a low soil temperature in summer favors starch contents of the tubers, then close planting, in promoting shading of the ground, tends to reduce the soil temperature. The higher the starch content the sooner the potato cooks, and the more it swells in cooking; but the flavor is not necessarily dependent upon the starch content. Soil and fertilisers used may affect it. A well drained, moderately rich, sandy loam produces the best flavored potatoes. Experiments with various fertilisers showed, at the New Jersey Experiment Station, the finest flavor from sulphate of potash, the next from yard manure, the next from those grown without manure, next from muriate of potash, and the poorest were from kainit.

328. *Martellin and Other Manures.*—Professsor Dr. Wohltmann, of Bonn, referred in a paper, read at Breslau, to this new manure, lately also introduced into South Australia, which contains about 25 per cent. of potash, and remarked that for hops and tobacco it has acted

exceedingly well. He is of opinion that *nitragin* is after all worthy of notice, especially where the soil held stagnant water, or for moorland, and where much nitrate of soda and kainit had been used and the soil thereby glued together. He prefers after many experiments, in some instances, *sulphate of ammonia* to *nitrate of soda*, if the former has been used early in spring, and if the soil contains much lime. (Dr. Kloepfer received from five experimental plots the following results per hectare, viz., with sulphate of ammonia, 62·6cwts. of grain; 46·4cwts., 81·8cwts., 95cwts., and 98·4cwts.; and with nitrate of soda, 59cwts., 45·6cwts., 79·4cwts., 89·6cwts., 87·6cwts. of grain.) In Poppeisdorf, where the soil received for sixteen to eighteen years only commercial manures, it required *farmyard dung* to bring about a fermentation in the soil, which improved its chemical qualities. Lime also improved its state; the soil did rise like dough. Experiments with *superphosphate* for beans were not a success; the roots contained but few excrescences, probably on account of the sulphuric acid. *Alinit* has to be still more tried.

329. *Harvest in Germany in* 1898.—Never before had it such a good average. Wheat, 3,428lbs. per hectare (about 22bushs. 50lbs. per. acre); rye, 2,470lbs.; barley, 2,922lbs.; oats, 2,762lbs.; potatoes, 20,840lbs. (about 82cwts. per acre); clover hay, 7,214lbs.; and meadow hay, 5,706lbs. per hectare.

Typical Orchard.

The SECRETARY reported on visit of inspection to the typical orchard, at Mylor, report of which would appear in the *Journal of Agriculture*.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Finniss, Mr. F. Everson; Bowhill, Mr. F. H. Baker; Woolundunga, Messrs. J. A. Prosser and G. Foules; Hawker, Messrs. James O'Loughlin and C. E. Harry; Lipson, Mr. E. Thorpe; Stockport, Mr. George T. Thomas; Port Elliot, Mr. J. Lovell; Dowlingville, Mr. E. Wilson; Swan Reach, Messrs. D. Rowe and W. White; Holder, Mr. E. Jaeschke; Mount Compass, Messrs. W. Gowling and A. Good; Mount Gambier, Mr. Geo. Body; Hartley, Mr. Ben. Wundersitz; Pyap, Mr. Harry Knight; Clare, Mr. G. S. Berriman; Caltowie, Mr. J. H. Both; Pine Forest, Mr. G. Inkster; Golden Grove, Mr. W. Mount-Stephen; Wilmington, Thos. Carter, sen.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of eighty-seven reports of Branch meetings.

REPORTS BY BRANCHES.

Penola, October 14.

Present—Messrs. J. Fowler (Chairman), J. W. H. Sandiford, J. T. Morris, H. Ricketts, J. A. Riddoch, D. McKay, E. McBain, S. B. Worthington, W. Miller, D. Balnaves, L. W. Peake, Dr. F. Ockley, and R. Fowler (Hon. Sec.).

CODLIN MOTH.—A committee of four had been appointed to draw up a petition to Parliament to protest against any relaxation of the Act and regulations dealing with codlin moth and other insect pests affecting fruit. This showed that the codlin moth has not yet been found in the Penola district; that it is possible to prevent its occurrence by adoption of precautions; that petitioners were alarmed at the movement being made to annul or relax the regulations under the Act, and desire that no such relaxation shall be allowed. This petition was signed by the Chairman and Honorary Secretaries of the following Branches of the Agricultural Bureau on behalf of the members, viz.:—Penola, Mount Gambier, Naracoorte, Millicent, Tatiara, and Lucindale. It was shown that Penola district has till the present been kept absolutely free from the pest, and that at the Coonawarra Fruit Colony upwards of 400 acres are under apple, pear, and numerous other kinds of fruit trees.

General Agriculture.—Mr. E. McBain read a paper on this subject. The following is the gist:—

Although now engaged in wine-making, he had been brought up to practical farming in eight distinctly different districts in South Australia. To farm successfully nowadays a man must be practical, and a thorough business man. The rising young farmers should either have a training at the Agricultural College, or spend some time in a commercial office as well as upon a well-conducted farm. Every farm should maintain some sheep. For a wheat crop the land should be fallowed 6in. deep early in spring, work down with a scarifier, and, if in a wet district, drill in some summer crop, such as maize or sorghum, about 2ft. 6in. apart, so as to allow of keeping the surface soil loose with Planet Jr. implements whilst the crop is growing. This should be fed off in February and March. Plough up the field 3in. or 4in. deep in April and May, work to a fine tilth to the whole depth, and drill in the wheat by the end of May. If the soil is too loose run the roller over it in front of the drill. If fallowing is not practicable, then plough 4in. deep as soon as possible after the first rains, and work to a fine tilth before sowing. Always use the drill, and never sow more than 1bush. of seed per acre. It is a slipshod fashion to plough in June or later, when the land turns up in lumps, and to sow upon such fields and just run the harrows over to smooth down the surface, leaving the bottom open and full of air spaces. Under such circumstances the plant may come up, but while it is yet tender, perhaps just through the ground in July, it has to encounter the coldest and wettest time of the year, and the crop suffers severely. Much depends also upon the suitability of the variety of wheat sown to the nature of the district in which it is to be grown. In regard to other cereals, the requirements are very similar to those for wheat. Our wheat-growing lands almost invariably respond readily to applications of phosphatic fertilisers. The use of potassic and nitrogenous manures is not required on the great bulk of our soils at present, but will probably be justified later on, when the continued use of phosphates has reduced the available potash and nitrogen. English super., 36 per cent. soluble, at £4 7s. 6d. per ton (£5 last season), drilled in with the seed, 1cwt. per acre, seems to be the best, and will hasten the ripening by about fourteen days. He was at a loss to know why dairying is so neglected in such a very favorable district as that of Penola. Each dairy cow should return a profit of at least £10 a year, and one man can attend to twenty head of milkers. System is essential. Where ten cows are kept there should be a cream separator, and the butter should be sent to Adelaide. The lowest price for separator butter this year in the city was 8½d., whilst at Penola it went as low as 4d. per pound. Costs for transit and sale did not amount to more than ½d. per pound. Jerseys are best. Keep a pure-bred bull. Kill all but one or two calves, from the best milkers, to keep up the herd. In a district with 28in. rainfall the butter and cheese factories ought to be kept running all the year through. Kale, rape, and mustard, and other crops should be grown for fattening sheep and lambs. Kale should be sown in drills 3ft. apart with 8ozs. to 16ozs. of seed per acre on deeply and well-prepared land about beginning of June, and thin out with the hoe. Kale lasts three years, and gives heavy crops. There should be no slack season on a farm. Horses should be kept in good condition, and should work eleven months each year. It does not pay to keep horses idle.

Super. Injuring Seed.—Mr. Ricketts wished to learn whether superphosphate has been known to injure seed wheat by collecting around the grain when sown with a drill. [Several thousands of tons of super. have been used by our farmers with great success, and this ought to be a sufficient answer to this question.—Gen. Sec.]

Richman's Creek, October 16.

Present—Messrs. W. Freebairn (Chairman), A. Knauerhase, J. M. Kelly, J. A. Knox, J. J. Searle, A. Nicholson, J. McSkimming, P. J. O'Donoghue, and J. McColl (Hon. Sec.).

Bulls.—Hon. Secretary reported that an offer had been received from the Agricultural Department to lend a first-class pure-bred Jersey bull in exchange for loan to another Branch of the Ayrshire bull belonging to this Branch, which had been offered to the department for sale. The offer was not entertained.

Congress.—Delegates reported appreciatively on their visit to the Eleventh Congress, the Agricultural Show, and to the Roseworthy Agricultural College.

Cleaning Wheat.—Mr. O'Donoghue strongly urged all farmers to thoroughly clean their wheat, as our wheat has been losing its good reputation of late in the English market. Wheatbuyers should put a distinctive mark on each farmer's wheat, as was done by the Farmers' Union.

Finniss, November 6.

Present—Messrs. T. Collett (Chairman), W. W. Heath, S. Collett (Hon. Sec.), and one visitor.

WEED.—The Chairman tabled an unknown new weed. [Proves to be a Silene ("catchfly"), which ought to be destroyed before it produces seed, as it is useless, but very prolific.—GEN. SEC.]

Mallala, October 2.

Present—Messrs. H. B. Moody (Chairman), G. Marshman, S. Temby, A. F. Wilson, J. McCabe, J. Jenkins, A Moody, W. Temby, W. R. Stephenson (Hon. Sec.), and one visitor.

"HINDRANCES TO SUCCESSFUL FARMING."—Owing to the member not being present who had promised to read a paper, Mr. J. W. Dall's Congress paper on above subject was re-read and vigorously discussed.

'Mallala, November 2.

Present—Messrs. H. B. Moody (Chairman), S. Churches, G. Marshman, A. F. Wilson, F. M. Worden, J. Jenkins, W. Temby, B. Cowan, A. M. Wilcox, W. R Stephenson (Hon. Sec.), and one visitor.

FALLOWING.—Mr. A. M. Wilcox read a paper on "Fallowing," which he considered was one of the most important operations in farming. Fallowing should always be done early—as soon as possible after seeding, provided the weeds have germinated. The first ploughing should not be less than 5in. deep, then cross-harrowed if the teams can get on to the land; this will start the weeds to grow. Sheep should keep these under until about September; then scarify deeply, and just before seed time scarify again, and roll till fit for the drill. In localities with fair rainfall summer crops could be grown on some of the fallowed land. Members differed with regard to after treatment, but all agreed that early fallow is beneficial.

IMPACTION.—Mr. Marshman said he had lost a cow. She was ill only two days. First the milk shortened off, then the fore legs became stiff. On being opened the second stomach was gorged, and was filled with hard, dry, undigested fodder. Mr. Wilcox had lost four cows, similarly affected, during the month, and others in the district have had similar losses.

Meadows, November 6.

Present—Messrs. J. Catt (Chairman), T. Brooks, G. Ellis, G. Rice, H. V. Wade, T. A. Buttery, F. W. Vickery, and W. Pearson (acting Hon. Sec.).

WORMY FRUIT.—Members do not favor any restrictions being placed on the sale of "wormy" fruit (infested with caterpillars of codlin moth), as they think it to be impossible to detect it in every case, and it is wrong to fine any one for unintentionally sending infested fruit to market. They advocated formation of Fruit Boards and competent inspectors to enforce measures for suppression of codlin moth. [No one has ever been or is likely to be fined under the regulations for "unintentionally" sending wormy fruit to market. ' It is very easy, in most cases, to detect where a caterpillar has attacked an apple or pear. It is only where cases of fruit with many affected specimens are found in possession of any person that any action is taken by the officers, and it is only by preventing the sale of this filthy fruit that certain careless growers can be forced to adopt precautionary measures. The codlin moth has been spread widely through the distribution of "wormy" fruit.—GEN. SEC.]

TECHNICAL EDUCATION.—Mr. Brooks advocated technical education in agronomical subjects being given in public schools at distances twenty miles apart, for the benefit of farmers' sons and others.

Holder, October 21.

Present—Messrs. F. A. Grant (Chairman), H. Blizard, W. Watt, J. Maddocks, H. Vaughan, C. Trimming, F. Slater, J. Green, F. Rogers, C. H. Perry, John J. Odgers (Hon. Sec.), and eight visitors.

CONGRESS.—Mr. Grant reported extensively upon the proceedings at the Eleventh Congress of the Bureau, which he considered not so beneficial as its predecessor. He advised members to study Mr. T. Hardy's paper on "Currant-growing."

INCUBATION.—Mr. J. Maddocks read a paper on this subject to the following effect:—Beginners with incubators must not expect to be successful at first; but with practice and a few failures they may get along. Treatment that will succeed in one locality will not always be suitable for another. The first requisite is a well-ventilated cellar, free from sudden draughts and changes in temperature, also free from jarring of doors or of floors above, such as may be caused by traffic or by children running about. Details of management of the incubator similar to those given lately in the *Journal of Agriculture* by Mr. D. F. Laurie followed. He considered that eggs for incubation should be less than nine days old when put in the incubator.

Carrieton, November 9.

Present—Messrs. W. J. Gleeson (Chairman), M. Manning, A. Stienke, C. Menz, and J. W. Bock (Hon. Sec.).

SUITABLE WHEATS.—From experience, members favor the early varieties of wheats for this dry locality, because they are hardier than the late, and are not so liable to be attacked by the locusts.

"BAGS IN."—Members considered farmers are hardly dealt with when wheat-buyers buy wheat bags (weighed in as wheat) at about 1½d. each, whilst the bags cost 7d. each. They wish all Branches to unite in doing away with this injustice.

Tatiara, October 14.

Present—Messrs. T. Stanton (Chairman), D. Makin, R. Penny, E. Prescott, H. Killmier, R. Scown, Thos. Hall, F. J. Green, and W. E. Fisher (Hon. Sec.).

ANNUAL REPORT.—Three papers only had been read, but good discussions had taken place on many important subjects. Some of the members had been very remiss in their attendance, and it would be necessary to take action in this matter. Twelve meetings had been held, with an average attendance of less than seven members. Members deplored the loss from their roll of the late Mr. Gilbert Ferguson.

CONGRESS.—The Hon. Secretary and other members were much pleased with their visit to the Eleventh Congress of the Bureau, which possessed great educational value. Both himself and Mr. Prescott were much impressed also with what they saw and learned at Roseworthy College Farm. The soil of the garden, orchard, and vineyard appeared to be very marly and poor, and if the professors succeeded there, it must be through hard, uphill work. Two years ago a paddock where pigs were running was very poor and perfectly barren, but it is now in splendid condition, owing entirely to Professor Lowrie's system of treatment. The educational value of a visit to the College Farm was very great.

OFFICERS.—The Chairman and Hon. Secretary were thanked for past services. Mr. T. Stanton was re-elected Chairman, and Mr. F. J. Green was elected Hon. Secretary.

Colton, November 4.

Present—Messrs. P. P. Kenny (Chairman), J. L. Higgins, W. J. Packer, Geo. Mayers, W. McElder, B. A. McCaffrey, J. Shipard, M. S. W. Kenny, and R. Hull (Hon. Sec.).

"BAGS IN."—Members are greatly dissatisfied with having to buy wheat bags at a high price and having to sell them weighed in with their wheat at nominal prices. Mr. G. Mayers thought the only solution of the difficulty would be for all farmers to join the Farmers' Co-operative Union. If this were done, the Union could control the market. At present, farmers are compelled to run after the buyers, in place of the buyers seeking the farmers. Mr. Higgins thought the Union was far too expensive a concern. The Chairman said the Union had fought an uphill battle, but was likely to do well in the future. Members would like to have all Branches of the Bureau to discuss this and the standard average bushel question, and arrive at definite conclusions on each subject.

Clare, October 20.

Present—Messrs. J. Christison (Chairman), W. Kelly, H. Miller, R. E. H. Hope, J. Treleaven, W. Birks, and H. J. Yelland (Hon. Sec.).

EXHIBITS.—Mr. Miller tabled an excellent sample of strawberries, the fruit being very large, ripe, and luscious.

DAMAGES BY FROST.—The damages done to vineyards and orchards by frost this season have been very great, and have occupied the attention of all fruitgrowers in the district. The apricot trees, which at the beginning of the month looked very promising for a good harvest, now show that the crop will be very poor. The same applies to the cherry, plum, and fig trees. In the vineyards the effects of the frosts are disastrous. The early buds as well as the succeeding ones have been all injured, the consequence being that the yields will be below the average. Mr. Miller stated that he sustained serious loss in his vegetable garden by a large area of young tomatoes being killed. Some growers tried to prevent the effects of the frost in their vineyards by means of "smudges," that is, by burning rubbish and straw close to the vineyard, and allowing the smoke to pass over the vines; but in the majority of cases this proved futile.

Wilson, November 11.

Present—Messrs. W. H. Neal (Vice-chairman), H. Need, R. Rowe, T. Barnes, H. Crossman, H. Ward, J. Coombes, A. Canning (Hon. Sec.), and two visitors.

CONFERENCE.—Decided to support the holding of a conference of Far Northern Branches at Quorn during February next.

LARGE CAULIFLOWER.—The Hon. Secretary tabled photos. of cauliflower, weighing 10½lbs., grown by Mr. Need, who afterwards cut one weighing 15lbs. This is phenomenal, considering the locality. He also showed some heads of "mummy" wheat, the ears of which are branched.

LOCUSTS.—Mr. Neal ploughed a strip around his wheat crops, and this stopped the hoppers until they developed wings. If the unwinged insects got on to the ploughed strip they could be destroyed by rolling or by again ploughing. [The Cape plan of poisoning with dissolved arsenic and sugar water sprinkled on herbage or chaffed fodder has proved quite effective. The method has been described in this *Journal*, and also in the weekly newspapers, but no one in this colony appears to have tried it.—GEN. SEC.]

STRIPPERS.—Mr. Rowe considered that the damp weather strippers thrash no better than the ordinary strippers when the weather is fine and hot. If the crop is at all damp the heads are torn off, the "backbone" or "stalk" of the head is not broken up, and is dangerous to stock eating the chaff. Grain stripped damp has far too many whiteheads in it, so that the sample is deteriorated. Some other members considered that the gain in cleaning wheat after a damp weather stripper is discounted by the extra draught of the machine. The majority held the opinion that the merits of the damp weather stripper are more than outweighed by its disadvantages.

EXPERIMENTS.—The Hon. Secretary suggested, and it was agreed, that experiments ought to be conducted to prove whether there is any advantage to be gained from the use of commercial fertilisers in such a dry district as this. Mr. H. Ward placed at the service of the members an enclosed piece of land, which has been under crop for many years, and is considered to be nearly exhausted. A committee will be appointed later on to conduct the experiments.

Richman's Creek, November 6.

Present—Messrs. W. Freebairn (Chairman), A. Knauerhase, J. A. Knox, F. Mattner, P. J. O'Donoghue, J. J. Gebert, and J. McColl (Hon. Sec.).

WHEAT.—The Hon. Secretary showed sample of Red Straw wheat, stripped this day. It was considered to be much superior to last year's sample. Mr. Knauerhase showed ears of wheat from Booleroo which were badly affected by frost. He had noticed a vast improvement in crops where commercial fertilisers had been used.

Redhill, November 15.

Present—Messrs. S. H. Treloar (Chairman), A. A. Robertson, D. Lithgow, D. Steele, R. T. Nicholls, and T. McDonald (Hon. Sec.).

SINGLE JUDGING AT SHOWS.—Mr. S. Treloar read a paper to the following effect:—

Agricultural shows should be made as educational as possible. By the present system of judging this object is not effected. Some of our most experienced breeders decline to act as judges under this system, but would regard it as a great compliment were they asked to judge singly. The public would then know who gave the awards, and, if satisfied, would readily consult such men in the future, whilst they might be misunderstood if they acted with two others. At most of the large shows in the other colonies, as well as at the great Smithfield show (for the first time) this last season single judges have been appointed. This plan necessitates smaller sections and a longer time for judging. Quite as many judges would still be wanted, but each department would be judged by an expert. Judges should not be required to stay in the ring too long—they often have several hours at the work when judging horses in action. Why not have separate judges, say, for harness horses, hunters, and hacks? He thought many judges acted differently in judging for a prize and judging for purchase. In the ring they will send two or three of the best horses around a dozen times, and then be no wiser ; but if any one of those judges wished to purchase a saddle hack, he would see the horse travel, handle him, and then mount. Before 100yds. have been covered he can tell whether or not it will suit. He can judge the strength, elasticity, and even soundness of the horse much better on its back than elsewhere. He (Mr. Treloar) had once mounted a horse which appeared sound in every particular, but when weight was put on him he could feel his off shoulder give, and shortly after the horse became dead lame. When a judge is in doubt he should ride the horse ; some of the prize-takers in this class would cause the death of any one who rode them seventy miles in a day. All judging should be by points, and committees should be appointed by the Royal Agricultural Society to draw up cards of points for judges in all classes. Then all breeders would know what to aim at, and the exhibits would not be subject to the mercy of any "faddy" judge, and any breeder would be able to find out what sires would best serve his purpose. The same system would apply to machinery and implements. Directly the judgment in any class has been made, the steward should affix a copy in a conspicuous place—in the case of horses, for instance, let the card with scale of points awarded be affixed to a board near the ring where they are judged—so that the public may see where the excellence of any particular exhibit lies, and what were the defects of the others. Disappointed exhibitors would then be able to rectify errors in future exhibits. To recapitulate, appoint single judges ; divide classes into small sections ; judge by uniform scale of points at all shows ; and publish the judge's card directly the award is made.

Mount Gambier, November 11.

Present—Messrs. J. Umpherston (Chairman), M. C. Wilson, W. Mitchell, J. C. Ruwoldt, A. J. Wedd, D. Norman, sen., T. H. Williams, J. Watson, and E. Lewis (Hon. Sec.).

WEEDS.—A species of Bartsia or of Salvia is becoming prevalent in the district, but is eaten readily by stock. Inula graveolens (stinkwort) has appeared in several spots, and should be attended to before it begins to produce seed. The Jeffrey bur is spreading rapidly, and as its soft seed carpels stick tenaciously to wool, the weed demands serious efforts to exterminate it by constant cutting or ploughing under. Cryptostemma calendulacea (or Cape Marigold) has been sown by some settlers to serve as fodder for sheep and pigs; but dairymen believe that it spoils milk. Some members thought that the weed would run itself out in time, but others showed that it had existed for over sixty years near Adelaide, and was still as luxuriant as ever. Buttercups (probably Ranunculus arvensis) are spreading rapidly throughout the South-East, and as they impart a bad flavor to milk, besides causing swelled mouth to stock eating the seeds, it is very desirable that all plants should be cut up and burned.

BULL.—Arrangements were made for inspection of the Ayrshire bull D'Orsay, also for his care and proper use.

Dawson, November 8.

Present—Messrs. R. Renton (Chairman), John Collins, C. W. Dowden, C. F. W. Just, W. Kelly, C. H. Meyers, O. Muller, A. H. Warner, A. F. Dempsey (Hon. Sec.), and four visitors.

WHEATS.—Several members tabled samples of wheat in the straw to illustrate best varieties for the district. Mr. Just showed a new variety, which he calls "Fill-the-Bag," showing enormous growth of straw and head. He has grown it for seven years. White Mexican, from Central Bureau, again looks well, but probably will not yield as much as "Fill-the-Bag" or Purple Straw. He can recommend it as a good sort for dry springs. Other members spoke equally favorably of Early Para. "Newman's Early," grown for the first time by Mr. Just, promises to be suitable for this district, being early maturing and prolific both in straw and grain. Mr. O. Muller showed Gluyas and Eclipse, the first being considered the more suitable, as the other is a late sort. Both showed excellent growth, and Gluyas is expected to yield 8bush. to 10bush. per acre. The Chairman, Mr. Warner, and the Hon. Secretary tabled Indian King and Bartlett's Crossbred, the latter meeting general favor, and both being considered worthy of further trial. Steinwedel and Purple Straw showed some splendid heads, but owing to brittleness and shelling properties Steinwedel is fast losing favor. For general purposes and extensive sowing the Purple Straw found most favor; Early Para takes second place.

THE HAIL STORM.—Members decided to raise a relief fund to provide flour and seed for the unfortunate farmers in the hundred of Coglin who had their crops destroyed by the severe hailstorm on November 5. Each member was appointed a collector, and several generous offerings were made at the meeting. Other Branches are to be asked to aid in this worthy work. It is estimated that 2,000 acres, promising about 3,000 bags of wheat, were destroyed in the hundred of Coglin, and some of the poorest farmers are left without a grain of their promised crop. Where the hailstorm missed the average, will probably be 5 bush. per acre.

LOCUSTS.—The locusts have done much damage to cereal crops and grass, and are clearing the gardens. They eat black tussock grass, kangaroo grass, but do not touch White Crystal grapes, whilst they defoliate Doradillas, Blanquette, Zante, and other grape vines, also onions, mustard, and bitter rue, but pass by the radishes. Live stock are falling off rapidly owing, it is thought, to dislike of herbage, &c., over which the locusts have passed.

Cradock, November 11.

Present—Messrs. R. Ruddock (Chairman), T. Marsh, B. Garnett, A. E. Clarke, J. Clarke, W. Haggerty, J. H. Lindo (Hon. Sec.), and one visitor.

CONFERENCE.—This Branch will be represented at the Conference of Far Northern Branches at Quorn, on February 14th 1900.

MACHINERY.—Mr. Garnett said Diavel's patent for lessening the draught of harvesting machines was effective. Other members spoke favorably of a scoop for wheat-cleaning made by the same patentee. A member said a useful scoop could be made from steel hoop iron, such as is used for binding bales, and the strength may be increased by corrugating the iron.

LOCUSTS.—Fearful destruction of crops and herbage has been done by locusts.

LOTUS.—Mr. A. E. Clarke reported that several cattle had been killed through eating lotus whilst in seed.

Strathalbyn, November 13.

Present—Messrs. M. Rankine (Chairman), D. Gooch, B. Smith, W. M. Rankine, P. Cockburn, and J. Cheriton (Hon. Sec.).

HORSE STOCK.—Members regret that the horse stock of this colony has steadily deteriorated for some years past, and think the best remedy would be a tax on all travelling stallions. Draught stock has gone back most.

CASTRATION.—Mr. M. Rankine read a paper on castration of bulls and rams, and exhibited a pair of clamps that he had used with much success. The following is the paper:—

A new way of castrating bulls and rams lately came under my notice, and having practised it the last two or three years I have not lost a single beast, although by every other way I had tried I have had losses, sometimes as much as 75 per cent. dying, some of the beasts as long as twenty-one days after the operation had been performed. Under the method I now employ I have operated on cross-bred and Down rams at all ages, when some of them were very fat, while others were very poor, and in frosty weather, also in warm weather when the flies were bad, without a single loss. I also operated on an old bull, and he went on feeding directly afterwards, and came and went with the other cattle without any perceptible difference except a slight stiffness. The plan is as follows:—Get a blacksmith to make the clamps, two pieces of flat iron, ⅛in. thick, ½in. wide, and 6in. long, with the ends flattened out to take two thumb screws, ⅜in. and 1½in. long, the holes in the bottom piece being tapped to take the screws, while the holes in the top one are slightly larger to allow the screws to work freely. Then, having secured the bull or ram in such a manner as to prevent undue struggling, open the clamps and place one jaw on either side of the strings of the testacles, across the body, and as near the body as possible, next screwing the jaws together as tightly as possible, a small wrench or pincers being used for the last few turns. Then with a sharp knife cut off the purse about a quarter of an inch from and below the clamps, and rub on a little ointment made of ground bluestone, lard, and alum, until the flesh becomes the color of cooked meat. Release the animal, and in four or five days take off the clamps as gently as possible; it is advisable to leave them on for a longer time in warm weather, when the flies may be troublesome, as sometimes in taking them off too soon there is a large gaping wound. Some people may think this is a cruel way, but I am convinced that it is not so, as at the last few turns of the screws is the only time that the animals struggle, and they invariably go on feeding a few minutes afterwards, and instead of moping about by themselves, keep with their companions. I can give an instance where an old bull was treated in this way, and the next day went away from home and jumped three or four fences while his owner was taking him home again. Of course, if there are a lot of rams to be castrated it is a slow way unless you have a number of clamps, but it will pay better to get a lot of them than to have a ram die, and then they could be put away for further use. A handy man could make the clamps himself, while a blacksmith would not charge more than, say, 1s. 6d.

Lucindale, October 7.

Present—Messrs. E. Feuerheerdt (Chairman), A. Matheson, J. Bourne, A. Carmichael, L. McInnes, and E. E. Dutton (Hon. Sec.)

Peach Aphis.—Mr. Tavender said he had tried many remedies for peach aphis with indifferent success, but thought kerosine emulsion gave best results. He could safely say that each fruit upon a yellow variety of peach tree cost him 1s. The aphis favored the apricot and cherry plum also, and he would like to know of a stock that would be resistant to their attack.

Ants.—The Chairman recommended honey and tartar emetic for poisoning ants.

Pyap, November 15.

Present—Messrs. B. T. H. Cox (Chairman), J. Harrington, J. Holt. J. Bowes, W. Axon, C. Billett, J. F. Bankhead, and W. C. Rodgers (Hon. Sec.)

Rainfall.—From September 20th to date, 1·48in.; weather, moderate. Reaping progressing, and crops moderately heavy.

Lyrup, November 7.

Present—Messrs. T. Nolan (Chairman), J. Sykes, O. Klemm, A. Weaver, W. Healy, P. Brown, A. Pomeroy, G. A. Bollenhagen, D. T. Tree, A. Menzies, T. R. Brown, W. H. Wilson (Hon. Sec.), and four visitors.

Gift.—Mr. F. C. Smith presented a parcel of a new variety of American kidney beans for trial.

Exhibits.—By Mr. A. Menzies, lucern plant, 4ft. 6in. high, sown last autumn and grown without irrigation. By Mr. O. Klemm, some nectarines from a tree where much of the fruit is splitting. The tree had not been overwatered, and was not heavily laden with fruit; there was no appearance of gumming, and in some cases the fruit colored afterwards. [Caused probably by sudden extremes of heat and cold.—Gen. Sec.]

CULTIVATING.—Mr. A. Menzies gave an address on ploughing and cultivation between trees and vines, illustrated on the blackboard. The gist of his remarks was that the greatest care must be used when ploughing, &c., in such places, lest the canes and branches should be injured.

Mount Compass, November 15.

Present—Messrs. R. Peters (Chairman), S. Arthur, R. Cameron, C. S. Hancock, A. J. Hancock, F. Slater, and H McKinlay (Hon. Sec.).

SEASONABLE WORK.—Plant potatoes, sow melons, cucumbers, pumpkins, squashes, &c.; transplant tomatoes and cabbages.

Mount Pleasant, November 10.

Present—Messrs. G. Phillis (Chairman), W. Vigar, W. Lyddon, J. A. Naismith, J. McConnell, J. F. Miller, and H. T. Hull (Hon. Sec.).

NORTHERN AREAS.—The Hon. Secretary said he had visited the North. Mr. Stienwedel had raised a new wheat which gave promise of being a valuable sort. Farmers were inquiring for bulk quantities of the seed oats raised by this Branch from imported Tasmanian seed, which are now doing well owing to the recent rain.

BULL.—Of seven cows six have produced calves to the Jersey bull loaned by the Agricultural Department. Four are heifers and two were bulls, which, being half-bred, were not wanted.

PIGS.—Mr. Naismith had castrated twenty pigs from six weeks to two months old. One died and others had severe swellings. The Chairman considered the best age for this operation was from three to six weeks.

CROPS AND STOCK.—Crops are looking well: stock thriving, with plenty of feed which is rapidly drying up.

Cherry Gardens, November 14.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, C. Lewis, J. Lewis, G. Brumby, G. Hicks, J. MacKereth, A. Broadbent, W. Nicolls, G. Nicolls, G. Patten, and C. Ricks (Hon. Sec.).

SOWING MELON SEEDS.—"Anxious" is informed that it matters little in what position melon and other seeds are placed in the soil. The best time to sow melons and others of that tribe is in October and November, or when the temperature keeps steadily above 75° F. Cover 1in. deep, lay the seeds flat in the soil.

SHOW.—A Committee was appointed to arrange for a Branch Show to be held during March next.

Tatiara, November 11.

Present—Messrs. T. Stanton (Chairman), E. Prescott, T. Hall, C. H. W. Wiese, J. Rankine, R. Penny, F. Smith, and H. Killmier.

AGRICULTURAL SHOWS.—Mr. Prescott read a paper to the following effect:—Large sums are annually contributed by the Government and supplemented by private subscriptions for agricultural shows, and the question arises, "Are we getting the best value under the present system?" We now see but very small amounts offered as prizes for the best draught entires as compared with what was offered at shows in the earlier days, thirty years ago, when from £10 to £20 was the prize. Now-a-days £2 is offered for a draught entire, and the same amount is offered for the best 6bush. wheat, worth only 15s. If a corresponding prize were offered for the horse it would amount to about £150, and that would bring forward a very different stamp of horses to what we see now. He believed it would be greatly to the advantage of farmers if one society only existed in the South-East, and that shows were held at three centres to be agreed upon. It might not be necessary to hold a show every year. If good prizes were offered, say, for draught horses, £75, £50, and £30, the chances are that three good horses would be secured for the district. and it could be so arranged that they should change their positions each year for three years, so that the whole area within the combined show district would have the benefit of each horse. He also strongly advocated a tax upon entires, and that thoroughly competent men only should be appointed as judges, and paid for their services. He also suggested that a conference of all the South-Eastern Branches should be held to discuss the matter at an early date. Mr. Killmier and others thought much depended upon the quality of the mare as well as upon the stallion. A motion was carried "That all stallions should be taxed."

Hartley, November 10.

Present—Messrs. A. Dalton (Chairman), H. Reimers, A. Thiele, T. Jaensch, W. Kutzer, J. Jaensch, W. Klenke, H. Lehmann (Hon. Sec.), and two visitors.

CARE OF FARM IMPLEMENTS.—Mr. Dalton said all farm machinery when not in use should be kept under cover. Through exposure to extremes of heat and cold, rain, and dry weather, the iron expands and contracts, making all the parts to become loose, the threads of bolts are strained, nuts, &c., become rusty, and every part requires to be tightened up, when the nuts are often broken up. The tenacity of the iron is also deteriorated. Directly an implement or machine is done with for the time, it should be cleaned, painted where needed, put into proper repair at once, and placed under the shelter of a shed. Mr. J. Jaensch had found that by greasing the mouldboard of a plough before putting away it brightened quickly upon being again used. Mr. W. Kutzer said oil could be burned off the mower without injury to the quality of the iron or steel. Mr. H. Lehmann was of the opinion that money spent on galvanized iron for sheds was better employed than in betting on horse races. Members were all agreed that farm implements, &c., should be sheltered, cleaned, oiled, painted, and kept in good repair, ready for use when wanted.

Mount Remarkable, November 16.

Present—Messrs. A. Mitchell (Chairman), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, J. B. Murrell, J. H. Girdham, T. H. Casley (Hon. Sec.), and one visitor.

LOCUSTS.—Several members reported total loss of grape crops through locusts. In future years they will try the poison recommended in *Journal of Agriculture*. Magpies, fowls, and sparrows were busy destroying the insects, but the crows left them severely alone, though very numerous in the locality; they were probably hanging about the station waiting for carrion, eggs, &c. [Busy eating locusts and other insects elsewhere.—GEN. SEC.]

HINTS FOR FARMERS.—Mr. Jorgensen read a paper in which he said so many hints had been given verbally, as well as in the *Journal of Agriculture*, that there was very little to be said that was new. All wheat-chaff should be carried to a heap in the field, and well covered with straw. This would serve as food for stock in cold and wet weather. The whole of the straw should be raked and stacked against some trees, or against poles stuck in the ground, so that stock cannot upset it. These stacks shelter stock against cold winds. All wooden gates, horseworks, hayframes, and land rollers should have a good coat of gas tar after harvest, as all cracks will then be open for reception of the tar. A second coat a few weeks later will be as good as painting, and much less costly. At end of autumn give all harness a dressing with castor oil to protect it against wet. Collars should be well stuffed. New collars soon become quite hard, and then they should be re-lined and stuffed. Within two or three weeks they will again be hard, but any handy man can then re-stuff them. Take hair of the mane or tail of horses, twist it into an inch thick rope till it is hard, boil it well, dry it, cut to lengths of 6in. or 8in., untwist the hair, which will then be nice and soft; then cut the stitches of the new lining at the back of the collar sufficiently to allow of the hair being pushed in. Take a piece of hoop iron, double a little of the hair over one end, and push it between the old hair and the new lining of the collar. Continue this until the collar is fitted evenly all over. Pass the hand over to see that there are no lumps. If not quite even, take an awl and put it through the lining, and work the hair till it is quite smooth. Sew up the lining again. Every farmer should have a little smithy for minor repairs and other smith's work. Before using any machine or implement, carefully examine it for loose nuts, bolts, &c. "A stitch in time saves nine." Members have noticed that right up to harvest the machinist's yards are crowded with harvesting implements that ought to have been repaired immediately after last harvest.

Maitland, November 4.

Present—Messrs. H. R. Wundersitz (Chairman), J. Kelly, W. P. Jury, T. Bowman, J. Hill, and C. W. Wood (Hon. Sec.).

Noxious Weeds.—Several species of noxious weeds were tabled, including wild mustard, wild cabbage, a thistle not previously known to members (the true star thistle—Centaurea calcitrapa), and a species of Pimelea, which, when cut along with hay, quickly causes the death of horses feeding upon it. Two kinds of poppy were tabled. The hairy thin-stemmed variety is spreading rapidly in the district.

Gawler River, November 17.

Present—Messrs. J. S. McLean (in chair), J. Hillier, R. Badcock, C. Leak, D. Humphries, F. Roediger, and H. Roediger (Hon. Sec.).

Standard Bushel.—The Hon. Secretary remarked upon the necessity of fixing a standard of the weight and quality of each year's wheat crop, in order to facilitate the sale of our surplus in the home markets. The standard should be fixed as high as the weight and quality of our wheat will warrant, because high-standard wheat will realise high prices. The produce of one season differs from that of another, therefore it would be impossible to fix a permanent standard of quality. Anyone selling wheat 2lbs. under standard has to submit to a reduction of, say, 1d. per bushel; but he is no worse off than he would be if the standard were fixed lower, because then he would have to accept a lower price; but those having a better class of grain would suffer by only getting the same price. He would prefer to have a first and second standard, one 62lbs.

and the others 64lbs., so that the higher quality would get the better price, and thus the good name of our wheat would be regained. Members generally approved of a high standard. Mr. Badcock said the average in the district this year will be over 63lbs.

Destructive Beetles.—Mr. Hillier produced a number of weevils which are abundant in his garden, destroying beans and mangolds. They are like the "curculia" (Otiorrhynchus sulcatus), but are smaller, more slender, lighter in color, and striped longitudinally.—[Desianthus maculatus, a native of Australia.—Gen. Sec.]

Pine Forest, November 7.

Present—Messrs. W. H. Jettner (Chairman), F. Masters, F. Inglis, G. Inkster, R. Barr, jun. (Hon. Sec.), and D. F. Kennedy, of Kadina Branch.

Branch Show.—After discussion, it was resolved that this Branch cannot indorse the action of the Show Committee in abandoning the proposed combined Branch Produce and Industrial Show at Port Broughton, and records disapproval of the course taken. Members referred to fact that considerable interest was being manifested by intending exhibitors, who were greatly disappointed by the action taken by the committee. The secretary of the committee wrote *re* advisableness of enlarging the scope of future shows to include live stock also. Considerable discussion ensued, members being of opinion that it was undesirable to multiply petty agricultural shows, that the Port Broughton was unfavorably situated for holding such a show, and the additional responsibility involved was not appreciated. It was therefore decided to oppose the movement.

Branch Conference.—It was decided to do everything possible to make the Conference of Northern Yorke's Peninsula Branches, to be held at Bute in February, a success. Mr. Barr promised to prepare a paper on "A Co-operative Threshing Plant for the District."

Congress.—The Hon. Secretary reported on proceedings at Eleventh Annual Congress, and on visits to Roseworthy College and Produce Depôt.

Homestead Meeting.—This meeting was held at the residence of the Hon. Secretary, and after the usual business was concluded the orchard and vineyard were inspected, together with outbuildings, stock, &c. A number of examples of home-made articles were favorably noticed.

Caltowie, November 20.

Present—Messrs. J. G. Lehmann (Chairman), S. Wenham, D. Wilson, A. Becker, J. Potter, J. Neate, J. Noonan, G. Petatz, A. Kerr, A. McDonald (Hon. Sec.), and one visitor.

Ear-cockle.—A discussion took place on the appearance of ear-cockle in wheat in a certain district. Members view with some alarm the presence of this pest, and urge the adoption of every possible means to prevent its spread. It was decided that members should make it a point to avoid obtaining seed wheat or hay from the infested district, and endeavor to get their friends to take similar precautions.

Wheat Pest.—Mr. Kerr drew attention to small red insect found inside the chaff upon the growing grain; it was about the size of hen lice, and very active. He did not know whether it was injurious, but had never seen it before. Mr. Petatz had seen insects answering to the description, but had never known them to affect the grain or crop.

LOCUST DESTRUCTION.—Mr. Kerr directed attention to the success obtained in Natal in poisoning locusts by means of arsenical baits. He thought with the locusts so plentiful they had a splendid opportunity of testing the efficacy of the remedy, and it became the duty of members to carry out experiments. He for one would not let the opportunity pass. Several members expressed the opinion that locusts poisoned with arsenic would in turn destroy birds and poultry that devoured them. It was agreed that the time was ripe for some such experiment as mentioned by Mr. Kerr.

VINES NOT BEARING.—Mr. Petatz tabled branches of vines from which the berries had a tendency to fall soon after setting. This had occurred for three or four years, though no signs of any disease were noticeable. The vines were very luxuriant, and had entirely escaped injury by the recent frosts. About four years ago they were heavily manured with well-seasoned farmyard manure. [Most probably the bunches were not properly fertilised, although after the flowers had fallen the ovaries remained attached for a short time. Some varieties are very liable to this fault.—GEN. SEC.].

FROST-RESISTING WHEAT.—Mr. Kerr called attention to paragraph in November issue of *Journal of Agriculture* on this subject. Of the varieties mentioned he had grown King's Early, and with the exception of some patches of low-lying ground where it had probably grown more rankly, the crop had resisted the frosts very well. It would be a great advantage if they could obtain a variety that would resist frost, rust, &c., but it usually happened that if resistant to one disaster the variety was very susceptible in another direction. Mr. McDonald admitted that some varieties would resist frost more than others, but very much depended upon the stage of growth when attacked. One variety might be in bloom while on either side the wheat might be further advanced or even more backward when the frost came, and in this case only the crop in bloom would suffer. Other members had heard of cases where King's Early wheat had suffered severely from frost, in some cases the top of the head, and in others the bottom part being without grain, but in most cases only one side of the head was found to be injured.

TREATMENT OF BROOD MARES.—Mr. Kerr stated that he had had a good deal of experience in the treatment and feeding of in-foal mares. He found that chaff and rich food, or any excess of food and water, had a tendency to gripe, which brought on slipping. In one season six mares out of thirteen slipped their foals, but he had been told by a good authority that if the first mare to slip had been at once removed from the others there would not have been such a large percentage of loss. He thought mares should not be worked within two months of foaling. Mr. McDonald thought the prevalence of slipping in the instance referred to was largely due to sympathy; he considered it beneficial to give the mares light work to within a short time of foaling Other members agreed.

Nantawarra, November 14.

Present—Messrs. E. J. Herbert (Chairman), H. J. C. Meyers, A. F. Herbert, S. Sleep, C. Belling, J. Nicholls, R. Uppill, J. W. Dall, R. Nicholls, and T. Dixon (Hon. Sec.).

FIELD TRIALS.—The Secretary of Bureau Field Trial Society wrote *re* proposal to hold trial only in each alternate year instead of annually. Members, however, favored holding trials each year, and doing away with money prizes. It was reported that the latest show and trials resulted in considerable loss. The question of holding the trials at Bute instead of Paskeville was also mentioned.

Clare, November 17.

Present—Messrs. W. Kimber (Chairman), W. Kelly, W. S. Birks, C. J. McCarthy, H. J. Yelland (Hon. Sec.), and one visitor.

"Die-back."—Mr. McCarthy tabled branch of Northern Spy apple affected by the prevalent disease called "die-back," the origin and nature of which is yet unknown.

Exhibit.—The Hon. Secretary tabled samples of wheats, Paltridge pea, and onions, grown on the school plots. These were fine samples, especially the wheat manured with Thomas phosphate, nitrate of soda, and muriate of potash.

Wheats.—A member who had sowed nothing but King's Early wheat this year is not satisfied with results, as it did not stool well. Other members object to bearded wheats, as they do not strip and clean easily. As millers are at present requiring a certain quantity of flinty wheats for milling purposes, it is thought that these sorts should be more cultivated.

Star Thistle.—This pest is spreading everywhere, and in this and other districts the Noxious Weeds Act does not appear to be properly administered.

Golden Grove, November 21.

Present – Messrs. J. R. Smart (Chairman), J. Woodhead, A. Marr, H. Bowey, J. Anderson, R. Smith, F. Buder, J. Ross, and A. Harper (Hon. Sec.).

State-owned Stallions.—Members do not favor the suggestion that the Department of Agriculture should import or purchase superior breeds of pure-bred stallions for loan to Branches of the Agricultural Bureau with the object of improving the breeds of horses. Mr. Smart thought farmers make a mistake in not breeding more foals to take the places of the older stock. Members generally agreed that it does not pay to breed whilst horses are so low in price, but admit that there is an advantage in having home-bred horses, of which the character and disposition is well known.

Pigs Dying.—Mr. Marr reported loss of pigs fed upon separated milk thickened with raw pollard, the milk generally being two days old. The pigs started scouring and went off their feed, dying within about a week. Other members reported similar cases of loss, in some cases the pollard being scalded first. Mr. Woodhead said it was a good plan to give the pollard dry, so long as drink is handy. [The Chief Inspector of stock states that in such cases it is impossible to tell what was the cause of death unless the animals are opened and the condition of the intestines, lungs, &c., noted. Worms may have had something to do with the trouble, or the scouring may have been due to giving too much separated milk. Separated milk should never be given without first scalding it.—Gen. Sec.].

Bute, November 14.

Present—Messrs. W. H. Sharman (Chairman), A. Schroeter, H. Schroeter, R. Commons, W. Langford, and W. Hamdorf.

Field Trial Society.—Matters in connection with the Bureau Field Trial Society were dealt with. It was mentioned that the next trials would be held near Bute, in August, 1900. The Chairman offered a piece of land on which to hold the same.

Branch Conference.—Arrangements for the Northern Yorke's Peninsula Conference of Branches, to be held at Bute on February 21st, were left to a committee.

Season.—Members reported that reaping would soon be general; those farmers who had started operations found the yields very disappointing owing to the damage by frost. Mr. Schroeter noticed that mice were again plentiful in the paddocks and homesteads. Rainfall recorded for October, 0·33in.; for two weeks of November, 0·60in.

Baroota Whim, November 18.

Present—Messrs. F. H. Flugge (Chairman), T. Simper, F. C. Bessen, A. Raneberg and C. W. Hoskin (Hon. Sec.).

Exhibit.—Mr. Bessen tabled fine sample of Bartlett's crossbred wheat, grown from two ounces of seed sent by Central Bureau, and returning 14lbs. The seed was sown on June 18; reaped November 10; height of straw, 2ft. 6in.

Locusts.—The seeds recently received from Central Bureau were sown, germinated, and were doing well, but the locusts came and devoured all the plants.

Brinkworth, November 18.

Present—Messrs. G. Freebairn (Chairman), S. Aunger, H. Shepherd, C. A. Horne, J. F. Everett, R. Cooper, A. L. McEwin, and J. Stott (Hon. Sec.), and one visitor.

Chaffed Hay and Wheat Chaff.—Mr. A. L. McEwin read a paper on feeding chaffed hay *versus* wheat chaff and crushed, or whole wheat, to horses. It was decided that the paper be read at the Bute Conference in February.

Wheat Samples.—The following samples of the new season's wheat were tabled by Mr. J. F. Everett, Early Para going 66lbs. to the bushel, and Petatz Surprise 67½lbs. to the bushel, both yielding well, the latter returning 23bush. from 1bush. of seed; by Mr. R. Cooper, Early Para, 66lbs. to the bushel, crop did fairly well; by Mr. W. Wilke, sample going 64½lbs.

Rainfall.—For year to date, at Condowie, 11·40in.

Arthurton, November 16.

Present—Messrs. W. Short (Chairman), T. B. Wicks, W. H. Hawke, M. Lomman, J. Koch, J. Pearson, C. L. Palm, M. Baldock, J. W. Parker, T. Baldock, J. B. Rowe (Hon. Sec.), and six visitors.

Homestead Meeting.—This meeting was held at the residence of Mr. W. H. Hawke, Tiparra. Members were greatly interested in the experimental plots, particularly those of selected wheats.

Field Trial Society.—Members were strongly in favor of holding the field trials in connection with the Bureau Field Trial Society each year instead of each alternate year, as had been suggested.

Hay Stacks.—The Hon. Secretary called attention to report of Cradock Branch in October *Journal of Agriculture*, page 330, in which the Chairman recommended building stacks on hard ground without any dunnage underneath. Mr. Short preferred dunnage under the stack. Mr. Hawke built his stacks on a raised place, and found this prevented mice from working in the middle of the stack. Mr. M. Baldock found old chaff very useful in keeping the bottom of the stack dry and sweet.

Rainfall.—Recorded by Mr. Short for November, 0·71in.; for ten months ending October, 11·96in.; by Mr. Hawke for November, 1·12in.; for ten months, 10in.

Balaklava, November 11.

Present—Messrs. P. Anderson (Chairman), C. L. Reuter, A. Manley, J. Vivian, E. Hams, A. Hillebrand, W. Smith, and E. M. Sage (Hon. Sec.).

STANDARD BUSHEL.—The question of the standard bushel and the present system of marketing wheat was discussed. Members considered the present system unfair, as the merchants dock for samples a little under the standard, but sell all as one sample. Members wished to know, if the inferior samples bought by the merchants were not so disposed of, what becomes of the wheat under the standard fixed by the Chamber of Commerce, and purchased by merchants at a lower price? It was stated that the S. A. Farmers Co-operative Union were buying wheat in two grades.

Mount Gambier, November 20.

Present—Messrs. J. Umpherston (Chairman), J. Watson, W. Barrows, J. Dyke, M. C. Wilson, D. Norman, sen., W. Mitchell, J. Ruwoldt, E. Lewis (Hon. Sec.), and one visitor.

FARM TOUR.—This day was devoted to visits to various farms, &c., around Mount Gambier. The party first inspected the Mount Gambier Cheese Factory, with which they were greatly pleased. Then they visited Mr. J. Ruwoldt's farm of 108 acres of very rich land. A crop of twenty acres of Tuscan wheat over-topping the fence is expected to yield 30bushs. per acre, which is good for a fourth successive crop, with 2cwts. bonedust last year. The crops have been wheat and potatoes, alternately. The Government Ayrshire bull, D'Orsay, was much approved of. Crops of oats, potatoes, &c., were all luxuriant and promising good yields. In the vegetable garden were twelve new and promising varieties of potatoes, imported and presented by Mr. F. Krichauff (Chairman of the Central Bureau), also two or three other varieties which are likely to be useful. Mr. Ruwoldt's farm is well supplied with implements and machinery of modern make, live stock, poultry, fruits, flowers, vegetables, &c. The next place visited was that of Mr. D. Norman, jun., who has 636 acres of first-class grazing land. In addition to a large substantial dwelling-house, there are strong large stables, woolsheds, granary, extensive styes, byres, &c. A number of cows are kept, and more than 100 pigs. Mr. Norman found it to pay better to feed pigs with wheat than to sell it at 2s. per bushel. Poultry also prove to be profitable under his good management. An orchard of one and a half acres was not in as good a condition as could be desired. About 400 acres are under crop. Mr. D. Norman, sen., was next visited. He has an orchard and garden of half an acre, which has been kept backward by a row of tall pine trees planted too close to it, but are now being removed. He is the only hopgrower left in the district now, and has only three acres. He says the decline of hop-growing is owing to the difficulty of obtaining pickers after the compulsory education regulations were adopted, and he lost about £100 a year for three years in consequence. Children were not allowed a recess at hop-picking time as they are allowed in vinegrowing districts. He used to grow thirty acres of hops, and the labor bill was £20 per acre, or a total of £600. The Yahl Cheese Factory was next visited, and some of the cheese tested and pronounced to be "excellent." Thence, on the way to O.B. Flat, several farms were admired, and it was noted that a larger area of barley has supplanted the wheat-fields of previous seasons. At a little after 4 o'clock Mr. A. C. Spehr's farm was reached, but the party only had time to look over the garden and orchard. This was one of the prize-taking farms when Messrs. Riddoch offered special inducements in this direction a few years ago. Finally Messrs. Davis Brothers' farm was reached. This took Messrs. Riddoch's first prize three years consecutively for best farm. The strong points here were stables, yards, implements, and live stock—everything in these lines being of the most approved character. The horses take a high position, cattle are of superior breeds, and the sheep first-class. Berkshire pigs are bred from the purest strains, and even the collie dogs are of high pedigree. The farm contains 1,000 acres, and maintains 1,300 sheep in addition to all the cattle and horses. At intervals during the day the party was hospitably entertained, and suitable acknowledgements were made in each case.

Morphett Vale, November 1.

Present—Messrs. S. F. Christie (Chairman), J. Depledge, J. McLeod, A. Jones, H. Liston, J. Perry, and A. Ross Reid (Hon. Sec.).

WHEATS.—Mr. Liston tabled eight samples of wheat, including King's Early, Earliest of All, and White Tuscan. He considered the latter the best for the district, with which most of the members agreed.

POULTRY.—A discussion took place on poultry. It was generally agreed that poultry-keeping paid if the time occupied in attending to them was not taken from other profitable labor. It was also agreed that if account was taken of the labor involved the balance-sheet would show that there was but little profit in poultry. It was suggested that numerous other small industries would pay well if labor was not reckoned in.

HAY CROP.—Members consider the hay crops between Adelaide and Willunga will not average much more than half last year's returns—say 12cwts. to 15cwts. per acre.

Holder, November 18.

Present—Messrs. F. A. Grant (Chairman), E. Jaeschke, W. Watt, F. Slater, F. Rogers, H. C. Perry, H. Vaughan, J. Rowe, J. Green, and H. Blizard.

EXPERIMENTS.—Members reported that, with few exceptions, the seeds received from Central Bureau were doing well. Rainfall for November to 18th, 0·97in.

PAPER.—Mr. Vaughan read the following paper:—

THE NECESSITY FOR EXPERIENCE IN PRODUCTION.—In Mr. Crocker's paper on "Finance and Cultivation" he showed us how necessary it was to keep a correct account of our finances. It matters, however, very little the state of our finances if we do not also gain the experience necessary to profitable production. Cultivation differs mainly through the influences of soil and climate more or less in every district covering a large area, and it is only by close observation of local conditions that we can expect to carry out our operations so successfully as to compete with other centres. It is therefore important that we keep, not only a financial account, but a strict account of all our operations connected with culture if we want to gain that experience which I think will prove in the long-run a far better capital than £ s. d. The progress made in this district with regard to cultivation has been necessarily slow. We have been chiefly occupied in laying the foundation of what I believe will become a large producing centre, and consequently our experience of the conditions of soil and climate existing here is limited. Most of us, too, are novices at getting our living from the soil, though perhaps this is an advantage, as we shall all the more readily digest our individual experiences, being unencumbered by customs and prejudices obtaining under different conditions elsewhere. The vast amount of solid information given from time to time in the *Journal of Agriculture and Industry* must prove of great benefit to all, and I have been particularly interested in those articles on fertilisers and the manuring of crops. There can be no doubt that the experiments conducted with the use of fertilisers will cause a revolution in methods of production, and we ought to profit considerably by the lessons taught. Here in our district we have special advantages for testing these manures under irrigation. I am glad to see that one or two of our members have taken the matter up in a practical manner, and I am anxiously waiting for results. Something must be done; we want to attend more to the experimental portion of our blocks than trust to good luck or accident to produce a crop of anything. It is a mistake to expect our soils to produce a payable crop without making special preparations for growing it. We have at least gained so much experience, that in a climate like this, with only a very limited rainfall, we should make every preparation in the autumn for conserving the moisture in the ground; plough deeply, and leave the soil in such a condition that we lose not a drop of the winter rains. We have also learnt by experience that in order to retain this moisture constant shallow cultivation must be practised in the spring, when all plant life starts into growth, as the loss of moisture through evaporation, not only of the leaf surface of plants, but also through the gradual rising of temperature, is increasing. Fortunately the character of our soil admits of easy working, and retains the moisture much better than that of a clayey nature, and I think this method of constantly checking the capillary action of the soil through continued cultivation is one of the great secrets of success in intense culture. In conclusion, that experience we need can only be gained by actual experiment under local conditions. It is not a wise plan to trust too implicitly to the varied results of experiments in other districts. Let us first find out what are the differences in soil, climate, rainfall, &c , and with the help of a little judgment and reasoning we may possibly reap some advantage.

Inkerman, November 14.

Present—Messrs. D. Fraser (Chairman), J. Sampson, T. Forrest. G. Peter, and W. A. Hewett (Hon. Sec.).

CONGRESS.—Mr. Fraser reported on proceedings of Congress.

EXPORT OF LAMBS.—Discussion took place on this subject, and the members were favorably impressed with the prospects of the industry through the facilities afforded by the Produce Export Depôt.

PIGS.—The Hon. Secretary initiated discussion on best breed of pigs for farmers. Mr. Forrest favored the Essex cross, as they did not roam as much as the Berkshire, and were quite equal in quality. Mr. Sampson also favored the Essex.

Hawker, November 15.

Present—Messrs. C. A. Hirsch (Chairman), J. W. Schuppan, R. Wardell, H. M. Borgas, Jas. O'Loughlin, and J. Smith (Hon. Sec.).

CONFERENCE.—It was decided to do all possible to make the Conference of Branches, to be held at Quorn on February 16th, a success.

HORSES FOR FARM WORK.—Mr. Wardell read a short paper on the most useful horse to breed for farm work. The most useful horse on the farm in his experience is a three-quarter draught horse, bred from a big, nuggety draught mare by a good strong upstanding roadster sire. Such a horse, if well cared for while growing, mostly has a small head, large round body, is light in the legs, with plenty of muscle, not too heavy in the bone, strong and active, capable of doing the heaviest work on the farm; in fact, does it with more ease than the heavy draught. It will also stand the heavy walking better, do the same amount of work in less time, and is not too clumsy to do the lightest work on the farm, thus saving the keep of an extra horse. for the light work. It requires less feed, which makes him the most profitable as well as the most useful class for the farm. Members generally agreed with Mr. Wardell. The Chairman emphasised the necessity for care in mating. It was not always the best looking animals that would produce the best stock. Members thought that very often sufficient care was not taken of the mare and foal. While the mare was suckling the foal she should receive plenty of good feed, and the foal should never be allowed to get a check. Mr. O'Loughlin considered it a mistake to breed from old mares, as the progeny will nearly always look old for their age and possess weak constitutions.

IMPROVEMENTS OF WHEAT.—The Chairman stated that he noticed several heads of Premier wheat carrying four grains across the head, and thought such should be saved for trial. [It will always pay to select any heads of wheat or other cereals showing desirable characteristics which are superior to the rest of the crop.—GEN. SEC.].

BROADCASTING VERSUS DRILLING WHEAT.—The Hon. Secretary reported having inspected Mr. Borgas's experimental plots, and considered they proved that the drill was not only the better, but also the cheaper maching for putting in the seed. There was a very marked difference between the plots, and 30lbs. per acre sown with the drill gave a better crop than 45lbs. broadcasted.

Orroroo, November 10.

Present—Messrs J. Moody (Chairman), M. Oppermann, E. Copley, S. Roberts, W. S. Lillecrapp, and T. H. P. Tapscott (Hon. Sec.).

MACHINE BELTING.—The Hon. Secretary wished to know best preparation to use on machine belting to preserve the belts, and also to prevent them from slipping on the pulleys. Most of the members use resin and oil, others treacle, and others castor oil.

Watervale, November 13.

Present—Messrs. E. W. Castine (in chair), S. Solly, H. Scovell, B. Perrin, and E. Treloar (Hon. Sec.).

SEASON.—Members reported that the heavy frosts experienced had played havoc with the young plants grown from seeds distributed by the Branch, and very few are now alive. It was also reported by several that their old apricot trees were losing their leaves. This was attributed by some to dryness of the subsoil.

Bakara, November 16.

Present—Messrs. H. R. Raymond (Chairman), E A. Hayward, R. Wilson, W. G. Wilson, J. Bates, F. C. H. Martens, J. E. Dietrich, J. E. A. Leidel, J. Herrmann, R. Barrow, A. Herrmann, J. V. Barrow (Hon. Sec.), and two visitors.

BUNT AND SMUT.—The Chairman read a paper upon smut (Ustilago tritici—synonym, Tilletia caries) and bunt (Tilletia tritici—synonym, Tilletia foetida), in which he erroneously stated that "many attempts have been made to discover the cause; but, as far as I have learned, every attempt has been unsuccessful." [It is beyond all doubt that these two diseases are parasitic fungi. They are a low order of microscopic plants, living parasitically upon cereal plants. They produce seeds (called "spores"), which become attached to the grains of wheat, &c., and germinate when damped, enter the young plant, grow up within the plant in the form of minute threads of mycellium, and at the last reproduce their seeds or germs within the skin of what should be the grain of wheat, oat, &c. When sown without pickling on dry soil the wheat or oats fail to grow at once, but there is often just enough moisture to start the seed or germ of the bunt or the smut, and in this case the parasite dies of starvation. The same thing occurs when seed is self-sown, if any germs should happen to have become attached, but generally such seed is more likely to escape contamination. Pickling with bluestone—steeping is best—will kill the germs of bunt or smut; but if bunt balls are left with the seed it is most likely they will be broken when being sown with the seed, and thus the seed becomes reinfected.—GEN. SEC.] In discussion members said bunt and smut are considered to be injurious when fed to horses, with hay or otherwise, making them short-winded.

Best Wheat for District.—The variety of wheat mostly grown in this district is Little Purple Straw, but there are small lots of Steinwedel, Dart's Imperial, King's Jubilee, Early Para, Barootа Wonder, Newman's, Velvet Pearl, and Golden Drop or Pollock. Dart's Imperial at present looks most promising.

Mannum, November 24.

Present—Messrs. J. G. Preiss (Chairman), J. W. Walker, R. Heidrich, G. Lenger, J. A. Schuetze, R. P. Scott, W. Kowald, H. Wilhelm, Hy. Brown (Hon. Sec.), and three visitors.

Takeall.—Mr. J. A. Schuetze tabled wheat plants affected by "takeall" in various stages; the appearance of the roots indicated attack by some insect. In discussing this matter, Mr. Kowald stated that at certain times a whitish substance is found in the soil, and on close examination proves to contain live insects of some sort; where this occurs "takeall" generally follows. Mr. Lenger had noticed in stripping patches affected by "takeall," swarms of small flies or other insects were seen. As other crops grown on these patches of soil were unaffected, it was thought that there was strong ground for belief that "takeall" was sometimes caused by insect attacks.

Wheat.—Mr. Walker tabled Twenty Weeks wheat of present season's growth. The grain was good, though small, and weighed 65¼lbs. per bushel.

Bureau Finances.—This Branch expresses regret that the allowances for Bureau expenses should have been reduced, as the members consider it absolutely necessary that the producers should have all information possible placed at their disposal, and to impede the work and efficiency of the Bureau by reducing expenses was a mistake.

Microscope.—Mr. M. Walker showed, by means of his microscope, a number of slides of insect life, also the bacilli of various diseases, the latter being lent by the Dairy Instructor. Considerable discussion on the various items shown ensued.

Naracoorte, November 11.

Present—Messrs. S. Schinckel (Chairman), B. S. Roach, Job Wynes, E. C. Bates, D. McInnes, O. Hunt, and G. Greenham (Hon. Sec.).

Freshwater Rush.—Mr. G. R. Forster sent roots of freshwater rushes which he had found at Binnum, at a depth of 33ft., in a well he was sinking, induced thereto by seeing the plant growing in his garden, and by the common belief that they are a sign of good water close to the surface. Water is generally found at a depth of 70ft. at Binnum, and there was no water at 33ft., where the roots had extended.

Impaction.—Mr. Bates described symptoms and *post mortem* of a cow of his which died after a four days' illness. Mr. Hunt pronounced the complaint to be impaction, and advised a dose of 1lb. to 2lbs. Epsom salts in such cases.

Ticks on Lizards.—Mr. Bates said he had found an iguana (lace lizard) smothered with ticks which he thought to be sheep ticks. [Snakes, lizards, dogs, and most other animals are liable to become encrusted with ticks found in mallee and other scrub on sandy soils, but they are not the common sheep tick.—Gen. Sec.]

Tuberculous Pig.—The Chairman said that the pig, which he had mentioned at the previous meeting as being ill, had been killed, and was found to be very much affected with tuberculosis. The pig had been purchased, and the stock inspector was trying to find out how the decease was contracted.

Tuberculin Test.—The Chairman said the inspector proposed to use the tuberculin test on small herds in the district. He would like to get twenty to thirty cows together, as it was just as easy to treat a number as to deal with a few. Some members thought farmers ought to be taught to test their own cows, but it was pointed out that some people, on finding that an animal was affected, would sell in place of killing it.

The State Bull.—Mr. Schinckel said the bull loaned by the Department of Agriculture had been entrusted to his keeping, and was being much used by dairymen in the district. Some members thought it would be desirable that the Department should buy a number of pure Jersey cows and sell at cost price to farmers, as cows could be purchased more cheaply in numbers than singly. Other members thought farmers should do a little more for themselves towards improving the breed of cows. They all wished to have the bull remain in the district for twelve months.

Shows.—Discussion on Mr. Bates' paper read at previous meeting was resumed at length, and finally Mr. Bates moved—"That it is advisable that the principal agricultural societies in the South-East should amalgamate with a view to holding one circuit show annually. Two voted for and two against; no decision arrived at.

Naracoorte School of Agriculture.—Mr. Greenham spoke very strongly against the absence of support of the local school of agriculture, and advocated the establishment of a school of mines and industry. Mr. Wynes thought some blame was traceable to the parents; decided to visit the school at next meeting.

Port Pirie, November 11.

Present—Messrs. P. J. Spain (Chairman), E. J. Hector, H. B. Welch, J. Lawrie, and R. J. Ferry (Hon. Sec.).

Rabbits.—Mr. Lawrie stated that rabbits were increasing at an alarming rate throughout the district, and had done considerable damage to the wheat crops in many cases. Discussion ensued, and it was decided that Mr. Lawrie bring the matter forward on behalf of the Branch at the next meeting of the district council.

Forster, November 21.

Present—Messrs. J. Johns (Chairman), J. Sears, F. Johns, C. R. A. Schenscher, J. A. Schenscher, J. Childs, F. Towill, J. Retallack, W. Sears, J. D. Prosser (Hon. Sec.), and two visitors.

Bartlett's Crossbred Wheat.—Members reported favorably on this wheat, which was early and a good yielder, but one member stated that it was too weak in the straw.

Stock Complaints.—Discussion took place on injury caused by seeds of barley grass sticking in the roof of horses' mouths. Mr. Sears thought only old horses suffered from this trouble, owing to condition of the teeth, but Mr. J. Johns stated he had had as much trouble with 5-year-old horses as with older animals. Other members agreed.

Seed and Manure Drills.—Considerable discussion took place on drills and their work, and various opinions were expressed concerning the merits of the different make machines.

Fallow and Sheep.—Mr. W. Sears advocated early fallowing as giving better returns and being freer from "takeall" than late fallow. He would plough in June or July, and work the land well with the scarifier to destroy weeds, and insects. He believed insects were often the cause of "takeall," Mr. Childs thought takeall partly due to ploughing under so much grass and straw instead of burning it off. In regard to sheep on the farm, Mr. Retallack said they could only keep one sheep to each ten acres on the average. Mr. Prosser said four acres would keep a sheep on the plains or cultivated land on the river frontage.

HOW TO WORK THE FARM.—The Hon. Secretary read a short paper on this subject. In his opinion the farmers in this and the surrounding districts would have to take more care in working their land to make it pay. A good plough and a good team are amongst the first essentials to success. Fallowing is also necessary. Before sowing the wheat he would either plough the fallow again, or scarify it. On sandy or loamy soil it will pay to get a drill and use superphosphate. For heavy clay soil Thomas phosphate was highly spoken of.

Koolunga, November 16.

Present—Messrs. T. B. Butcher (Chairman), J. Button, R. Palmer, J. Butterfield, W. T. Cooper, W. J. Jose, and G. Pennyfield (Hon. Sec.).

STANDARD BUSHEL.—At previous meeting a long discussion took place on this subject. Members were of opinion that it would be a great mistake to fix too low a standard, but thought the merchants should offer inducement to farmers to clean their wheat thoroughly. The Hon. Secretary tabled annual report of the Minister of Agriculture, and read several extracts from same.

Wilmington, November 20.

Present—Messrs. J. McLeod (in chair), H. Noll, J. Lauterbach, J. Schuppan, J. Hannagan, and R. G. S. Payne (Hon. Sec).

CONFERENCE.—Quorn Branch wrote asking members to send exhibits of cereals, fruit, &c., to Conference of Far Northern Branches to be held in February; also inviting papers on practical subjects.

BITTERNESS IN CUCUMBERS.—Mr. Noll asked—"Why do cucumbers become at times very bitter?" Excessive watering, surface watering, use of deteriorated seed were suggested, and it was decided to ask the General Secretary for the cause of the trouble. [The cause of the cucumbers becoming bitter is very obscure. To grow cucumbers of good quality it is generally recognised that they must be grown quickly, and many growers attribute the development of bitterness to a check in the growth of the fruits. As, however, bitter and sweet fruits of apparently the same age, and sometimes fruits partly sweet and partly bitter are obtained on the same plant, this explanation can hardly be regarded as satisfactory. As the wild cucumber naturally contained a bitter principle, it is quite possible that the trouble referred to is due to the plants reverting to their original characteristics. Will members of other Branches give their experience on this matter.—GEN. SEC.].

LOCUSTS.—Considerable discussion took place on the ravages committed by the locusts, and questions were raised as to preventive action other than those previously mentioned in the *Journal of Agriculture*. The Hon. Secretary stated that a member of the Branch had sprayed his trees with strong solution of tobacco, soft soap, and kerosine, and this proved effectual in averting damage. Some members thought the kerosine would have an injurious effect on young wood. [Not if a perfect emulsion is made.—GEN. SEC.]. Members wished to know whether such plants as melons, cucumbers, and tomatoes could be protected by means of any spray. Mr. Hannagan thought that Paris green, sugar, and water could be used with good result. [Fruit trees and vines could be protected by spraying with 1oz. Paris green, 1lb. sugar or treacle, and ½lb. fresh lime in 12galls. to 15galls. water. With more tender plants, about 20galls. of water will be required. Plants such as melons, tomatoes, &c., could also be protected from most gnawing insects by dusting them well with Paris green and air-slaked lime or wood ashes—1 part of the poison to 100 parts of lime or ashes.—GEN. SEC.].

Mundoora, November 7.

Present—Messrs. W. Aitchison (in chair), A. McDonald, D. Smith, W. Shearer, J. J. Vanstone, J. Loveridge, W. D. Tonkin, W. Mitchell, and A. E. Gardiner (Hon. Sec.).

STANDARD WEIGHT OF WHEAT.—A long discussion on this subject took place. Most members failed to see that any advantage would be gained by fixing the standard at 65lbs. when a neighboring colony with a 63lb. standard can obtain just as much for their wheat. The Hon. Secretary strongly advised those who had a good sample of grain, and were not satisfied with the treatment meted by the wheat merchants, to clean it well and ship it home through the Farmers' Union. Members were all agreed that the standard should be fixed annually by the Chamber of Commerce, but consider the farmers should be represented, and think the General Secretary of the Bureau should be asked to represent the growers. It was resolved that, in the opinion of this Branch, 62lbs. would be a fair standard for this season, though is was believed this district would average better than this. Messrs. Tonkin and Aitchison tabled fine samples of Steinwedel wheat from the new crop; the former also tabled sample of the seed sown, it being pinched and small; the crop was drilled in with fertilisers.

FERTILISERS AND WEEDS.—Mr. Smith said last year he noticed in a paddock at Gulnare sown with wheat and Thomas phosphate the previous season, that on a strip the width of the drill where no fertiliser was used stinkwort was abundant, though the rest of the paddock was clean. Mr. Aitchison had noticed similar effect in regard to growth of other weeds. The members would like to learn whether the manure would prevent the growth of weeds. [Manuring the land should result in increased growth, whether of crop or weeds. It has been stated before that stinkwort does not grow so thickly on land manured with phosphate, but it is impossible to understand why it should not.—GEN. SEC.].

BLACK RUST.—Mr. Vanstone noticed much of this disease in the crops, especially on the flats. Manured crops were equally affected, and he would like to know cause of same. [Black rust is a fungus disease, called Urocystus oculta.—GEN. SEC.]

SCARIFYING IN SEED.—Mr. D. Smith stated that on a piece of stubble land on which there was too much straw to harrow he sowed the wheat in front of the scarifier, but results were very poor, the crop being unable to stand the dry weather. Another piece was raked over to get the straw off, then scarified, sown, and the wheat harrowed in. This gave a good return.

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NOTES AND COMMENTS.

Reaping operations are drawing to a close in most of the earlier districts, and many complaints are made of the damage done by the frosty weather experienced during October. On the other hand, many crops that were apparently badly affected are turning out well. New wheat is coming to hand slowly, and on the whole the sample appears to be good. December has not been altogether favorable to rapid progress with reaping operations, but there has been an absence of weather calculated to injure the standing crops. There have only been a few unimportant showers recorded during the month throughout the agricultural areas.

The secretary of the corn trade section of the Chamber of Commerce has issued circulars requesting the forwarding of fair average samples of wheat of present season's growth that has been bought and sold at full market price, on which no reduction has been made. Samples of 14lbs. weight are requested by January 8, 1900, as the standard weight will be fixed on Wednesday, January 10. Presumably the Chamber of Commerce is of opinion that the farmers have no right to have any say in this important matter of fixing the standard weight of the bushel for the season, as repeated requests that the committee should have at least one representative of the producer meet with no response. Under present conditions it is scarcely likely that there will be any better response than in previous seasons to the request for samples.

In another column appears the report of the Select Committee appointed by the House of Assembly to inquire into the codlin moth regulations. The Committee was really appointed to deal with a petition presented to the House on behalf of a number of growers and packers, asking for a repeal of certain clauses of the regulations, only one of which, *i.e.*, the sale of infested fruit, had been strictly enforced. It is gratifying to the officers of the Department of Agriculture to note that the Committee recommend that the regulations, other than the one mentioned, should be amended in such manner as will really make them agree with the spirit in which the inspectors have interpreted the regulations in the past. Growers will, we believe, in the majority of cases be glad to note that the Committee is opposed to the sale of infested fruit, but recommend the adoption of the suggestion of the Inspector of Fruit: that infested fruit treated in such manner as the inspector may consider necessary to destroy the caterpillars and under proper restrictions may be disposed of to manufacturers

Phosphatic manures in this colony generally give good results, because potash and nitrogen are present in the soil in sufficient quantity. But with every succeeding crop taken off the land the potash and nitrogen in the soil will become less and less, until finally there is not enough available to produce a full crop. Then it will be necessary to supply manures containing potash and nitrogen. It is most probable that there are farms which require those fertilisers already, and it will well repay every farmer to grow test plots, to which varying proportions of each of these fertilisers shall be applied, both separately on some and mixed on others. If too much of any such manure is applied it will not increase the crop, but may remain locked up in the soil for years. Therefore one wants to know what his soil requires and in what proportions it is to be supplied.

The necessity for every farmer carrying out experiments for himself in order to ascertain the most profitable form in which to purchase phosphatic manures is strongly emphasised by the varying results obtained from the different fertilisers. In the same district and, in fact, on the same farm the returns obtained on the different classes of soil vary to an astonishing degree. On some soils bonedust appears to have no effect whatever, while close alongside it gives better returns than any other manure. So with super., Thomas phosphate, and guano. This explains the apparent inconsistencies in the reports of various experimenters, and should encourage those who find one manure to give but little extra return to try another.

During the coming season very large quantities of commercial fertilisers will be imported, and from present appearances the quantity used will show a large increase over last year's total, which showed a marked advance over the previous year. As far as possible all shipments will be sampled by the Inspector and analysed, the analyses being published from time to time. Persons who have ordered their supplies of fertilisers should take a careful note of the official analyses, and if the latter do not agree with the vendor's analyses as shown in their advertisement notices, or as given by their agents, they should at once communicate with the Inspector. The provisions of the Fertilisers Act, if availed of by the purchaser, afford ample provision against unfair dealing, and breaches of the law should be brought under the notice of the authorities.

Four hundred pounds weight of hen manure is equal in value to 2,400lbs. of farmyard manure. In a ton of fowl manure analysis showed 48·60lbs. phosphoric acid, 48lbs. potash, and 67lbs. nitrogen; whilst farmyard manure contained only 6lbs. phosphoric acid, 10lbs. potash, and 11lbs. nitrogen in one ton. Much of the value of any manure depends upon its freshness and whether it has been kept under cover and dry.

Five years ago the Turkish Government prohibited the export of Angora goats, fearing that other countries would compete with them. Since then Cape Colony has been breeding up and culling, until the farmers believe there is nothing better than their own goats, and the Cape Government now penalises the export of Angoras to the extent of £100 for each goat. American breeders also begin to claim that their Angoras cannot be excelled, but there is no export duty on goats in America. Angora in Asia Minor is 29,000 square miles in area, and from 1894 till 1897 produced 1,230,000 goats; whilst in the same time Cape Colony, with an area of .221,000 square miles, produced 2,891,223 Angora goats. The yield of mohair in Angora was 3,360,000lbs., and in Cape Colony, 9,982,000lbs. during the same time. Average per goat in Angora, 2¾lbs.; in Cape Colony, 2¼lbs. Value in Angora, £200.000, or 1s. 2½d. per pound; in Cape Colony, £419,500, or 2s. 11½d. per pound. The average per goat in Angora, 3s. 3½d. per annum; in Cape Colony, 2s. 11½d.

The intimation of the Minister of Agriculture for Victoria that he was favorable to the replanting of phylloxera-infested vineyards with American resistant stocks, as well as to the general use of these stocks, would seem to indicate that all official action to stamp out the pest is to be dropped. This action will lead to the rapid spread of the insect, and it will only be a few years before it is firmly established throughout the vine-growing districts of Victoria—a very serious matter for South Australian vignerons. One of the first duties of the new Phylloxera Board will be the necessity for further regulating the introduction into this colony from Victoria of plants, fruit, &c., likely to convey the pest from centres of infection.

One of the principal points in storing potatoes, or, indeed, any other root or fruit, is care in handling. To keep successfully they must not be bruised or injured in any way. This necessitates care in digging—a point often neglected—and care in handling or carting. Bruised potatoes will soon decay, and cause those surrounding them to perish also. The proper treatment of any that should become bruised is to separate them when bagging, and use them or dispose of them for immediate consumption. In many parts of the world it is the practice to market potatoes in baskets or boxes, whereby injury is considerably reduced.

The X-ray raisin-seeder is a little patent for kitchen use which takes the seeds out of raisins, without waste, and does as much work in ten minutes as a woman could do in half a day with a knife and her fingers. Raisin-seeders run by steam are now in use in the United States of America, which run through many tons of raisins each day. In the near future there will be very few raisins with seeds in them for sale in our grocers' shops. The X-ray seeder costs less than 4s. Renmark "seeded" raisins are now obtainable from the Adelaide grocers at a reasonable advance on prices for the ordinary Muscat raisin.

Mr. Geo. Jeffrey's little work on "Australasian Wool-classing" is of much value to all who keep sheep. It treats upon a subject which has not before been dealt with in such a practical manner in any work that has come under notice. Mr. Jeffrey has so long been intimately and practically associated with the wool industry in all its branches that he is fully justified in writing this book. He now occupies the position of Instructor in Wool-classing at the South Australian School of Mines and Industries; and is also forming classes for wool-classing all over the colony, in which object he hopes to receive the support and assistance of the numerous Branches of the Agricultural Bureau.

The horse botfly has lately been troublesome in Tasmania, New Zealand, and Victoria. Last year one farmer in Namurka, Victoria, lost seven draught horses, valued at £140, from this pest. It is strange that the bot fly has not yet been introduced into South Australia. The fly deposits its eggs upon the hair of horses and other domesticated animals, in positions where the animal can lick itself. By this means the eggs are carried into the stomach, where they hatch, and the maggots perforate the stomach and intestines, and thus cause the death of the horse. [Since the above was written Mr. M. W. Kavanagh, of Echunga, sent a fly to Mr. J. G. O. Tepper, F.L.S., Entomologist at the Adelaide museum, which that gentleman declares to be a species of Gastrus, or ox botfly. Read Mr. C. J. Valentine's notes in another part of this issue.—ED.]

A ton of cheese removes from the farm, in the form of nitrogen, phosphoric acid, and potash, about £3 14s. 7½d. in value. A ton of butter takes only 2s. 4d. worth of those fertilisers; a ton of whey, 3s. 11d.; a ton of buttermilk, 7s. 1d.; a ton of skim milk, 9s. 8½d.; a ton of cream, 7s. 3d.; and a ton of milk, 9s. 3d. It will, therefore, impoverish the farm much less to make butter than to manufacture cheese. A ton of cheese removes 112lbs. nitrogen, worth £3 10s.; 17¾lbs. phosphoric acid, 3s. 11d.; and 2·15lbs. potash, worth 8½d. A ton of butter contains about 2¾lbs. nitrogen, worth 1s. 8d.; 1½lbs, phosphoric acid, worth 4d.; and 1lb. potash, worth 4d.—total, 2s. 4d. With cheese nearly everything in the milk is removed from the farm; but with butter only a small portion is taken away, and the rest is used on the farm to feed the live stock.

THE EFFECT OF THE SIZE OF SEED ON THE POTATO CROP.

The effect of the size of potato "seed" is one on which various opinions exist. The *Michigan Farmer* says:—"When cut, some maintain that one eye is all that is wanted, and the crop is as good with this as with more. Some consider that it is a waste to plant the sets whole, while others think the best results are got with uncut seed. With the object of throwing some light on this matter, experiments have been conducted at the Guelph Experimental Farm. Having lasted for four years, these may be taken as pretty reliable, and they emphatically show the advantage of planting good sets.

The first set of experiments, which extended over four years, was to test the effect of the number of the eyes in the sets. Though nine of the different sets were failures, still the difference in the yield between those with one eye and those with five was very considerable, amounting to about 28bush., the results being as follows:—

From 1 eye, 136·41bush. per acre
From 2 eyes, 144·70bush. per acre
From 3 eyes, 153·13bush. per acre
From 4 eyes, 162·82bush. per acre
From 5 eyes, 164·37bush. per acre

Up to four eyes in each set the increase in the yield is, roughly, 9bush. for each additional eye, so that up to that extent the increase in eyes would be well repaid in the yield."

TO REMOVE PAINT.—Mix two parts liquid ammonia with one part turpentine, shake until it emulsifies, then brush it on to the old paint, which will soften very quickly, and can be easily scraped off with a blunt knife.

FRUIT TREE PRUNING.

No. 8.—By Geo. Quinn, Horticultural Instructor.

Pruning to Avoid Decay.

This is a subject of primary importance to the well-being of orchard trees, and can scarcely be practised successfully until the pruner has obtained an intelligent grasp of how a tree is built up by the addition from year to year of successive layers of cells.

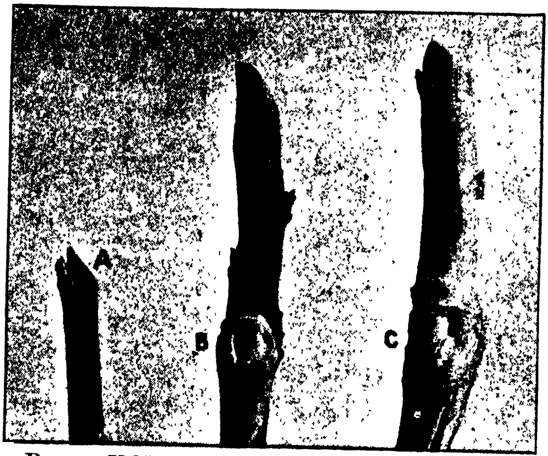

Plate XCV.—Showing Position of Cut Conducive to Rapid Healing of Wound.

It may be argued that if a tree is trained correctly from the outset the amputation of large limbs will be unnecessary as it attains more mature years. This contains much truth; but accidents, or the need to re-furnish the lower limbs or renovate by grafting, usually render such operations necessary to a certain degree.

If the pruner pursues faulty methods in making sections, whether with knife, seccateur, or saw, be they upon large or small branches, evil results must follow sooner or later.

Pruning of any kind causes a wound, and, other things being equal, it is in accordance with the age and development of the part affected that the period

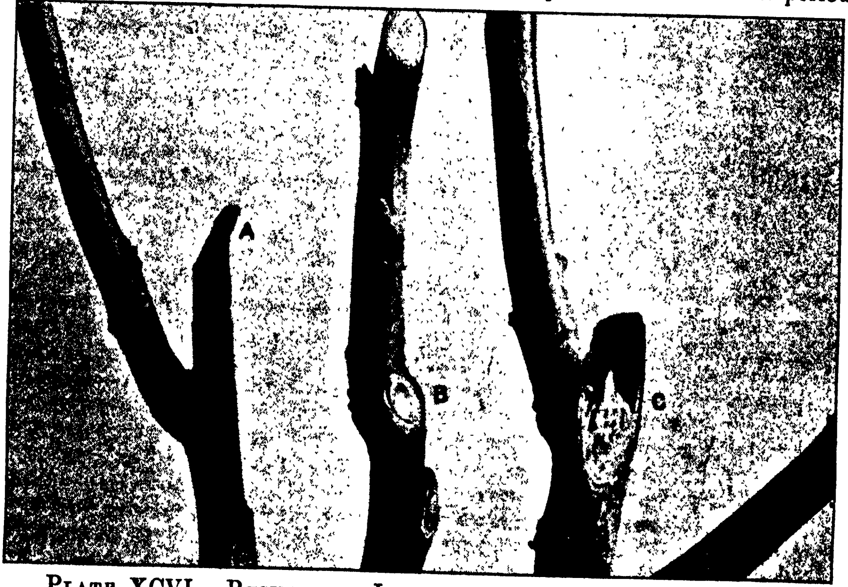

Plate XCVI.—Results of Improper Cutting of Branches.

of healing is delayed or hastened. For instance, the young sappy point of a shoot pinched out ere it gets beyond the composition of cellular tissue, is healed over in a little while, and scarcely leaves a trace of the injury. A large branch a foot or more in diameter, when severed, may never be able to heal over the cut section.

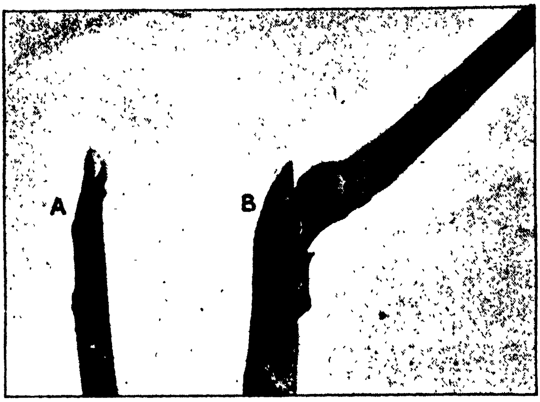

Plate XCVII.—Cutting Below the Bud and one Result.

If a newly cut section of a large limb of, say, an apple tree is examined, it will be readily noted that it has been built up by a succession of concentric rings of growth, each added *externally* year by year. The rings in the centre are harder, and matured into extremely stiff woody fibre, possessing apparently little vitality. As the examination proceeds towards the outer margin the wood becomes more sappy, and as the margin is reached it ends in contact with the corky substance we call bark. If an incision through the bark is made during the period of active growth it will be noted that immediately beneath it a sappy brittle layer of tissue is being formed This is known as the cambium layer, and it represents the portion of the stem which is actually growing, and which will form, as it ripens in autumn, the last concentric layer referred to before. The inner layers of woody fibre have not perceptibly grown either in length or breadth since ceasing to be of this nature. This explains at once why the small sappy shoot heals more rapidly than the large woody limb. In the first case the whole of the wound was made in the annual layers; in the second the cambium layer must grow from the outer edges—beneath the bark—until they concentrate and cover the whole of the wounded surface. In Fig. 2 of Plate C this healing process is depicted as it takes place around a large wound under favorable conditions.

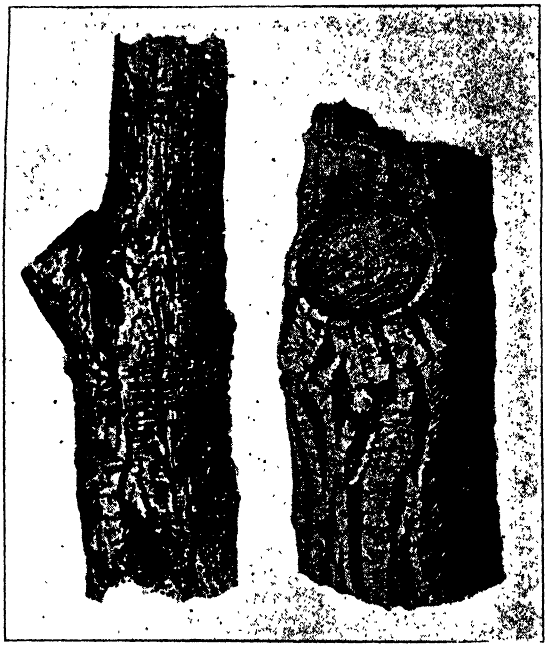

Plate XCVIII.—The Wrong Way to Make a Wound—Side and Front Views.

(After Bailey.)

The annual additions of this layer of growth built up on the *outer* surface of that made during the previous season increases the diameter of the branch, and bursts the drier bark, giving rise to the cracked scaling bark, well known as a refuge for certain orchard pests.

To avoid decay a rapid healing of the wound is necessary. A wound which comes directly under the influence of the sap as it flows freely into buds or shoots making active growth will be healed up most rapidly. This is why, in former chapters, the pruner has been advised to shorten back a useless or unfruitful limb to where a healthy shoot arises from it, and not to a blind budless stump which possesses no means of drawing sap to heal itself. The relation which this healthy shoot bears to the wound on a large branch is similar to that borne by the yet dormant bud on a yearling shoot to the wound made in shortening it back to direct its growth in any desired direction.

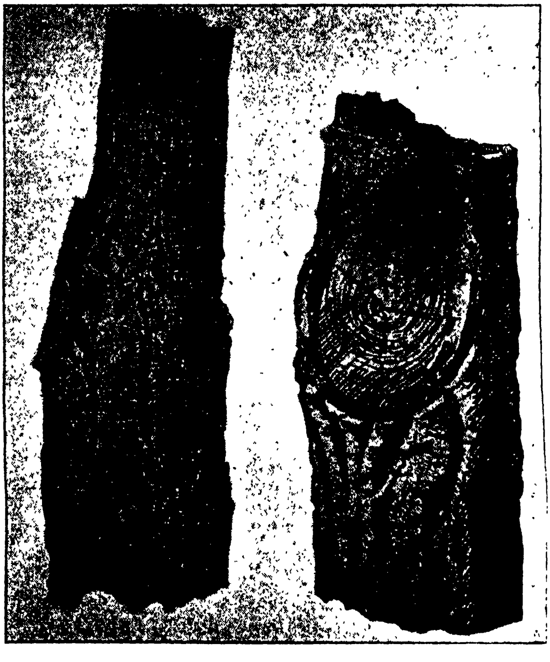

Plate XCIX.—The Right Way to Make a Wound—Side and Front Views. (After Bailey.)

In Plate XCV., at *a*, the position of the section to the bud is one which practice has proved highly favorable to the rapid healing over of the wound. It will be noted that it begins about on a level with the base of the bud, and directly opposite to it, and slopes obliquely off just over the apex of the bud. At *b* the healing of the wound a season later may be seen, and at *c* the healing process is almost completed during the next summer.

At *a* in Plate XCVI. is a section made in a manner liable to prevent an early healing of the wound, and to give every opportunity for permanent injury being sustained by the branch. This blind stub has already died down half its length, but if cut as indicated at *b* on same plate, the injury would be arrested and proper healing insured.

Fig. *c* shows how decay gradually creeps down a dying stump until it reaches a lower point than where the sap passes into the shoot immediately below it. This shoot would have drawn sap to heal it over had the section been made as seen at *b*, but now the descending decay will injure this shoot to such an extent that it may split off, or be outstripped by another immediately below the decayed portion. This in a young tree may destroy its symmetry.

At *a* in Plate XCVII. a section is shown in which the pruner has gone to another extreme, and cut too far below the bud intended to give rise to a leader. This wound could not heal rapidly because the bud must be half starved. This would result in a lower bud gaining the ascendency, and there is much danger of the splitting shown in *b* resulting in after years, In Plate XCVIII. the side and front views are shown of a wrongly-placed section made in severing a large limb. In Plate XCIX. similar views of a rightly-made section are shown.

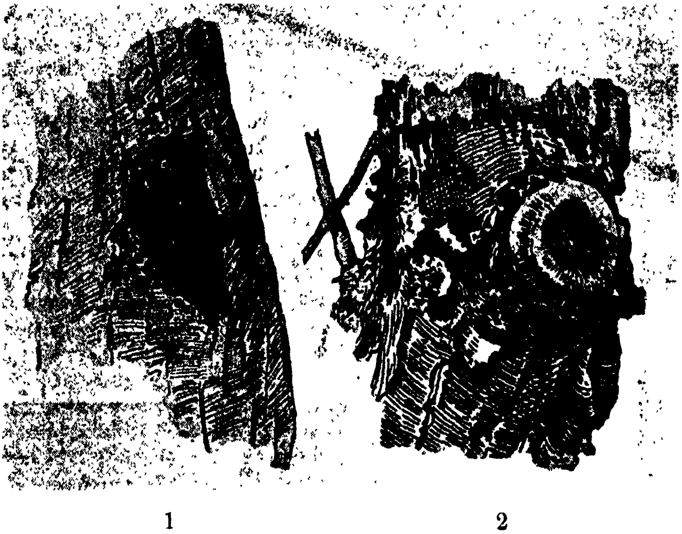

PLATE C.—RESULTS OF (1) IMPROPER CUTTING OF LIMB; (2) PROPER CUTTING OF LIMB. (AFTER BAILEY.)

In Plate C the wrong and the right methods of cutting off a large limb are depicted. The results speak for themselves. The dead stump at Fig 1 will prevent the wound healing over, and gradually the decay will sink into the heart of the trunk, and when the dead stub falls out a knot hole leading into a hollow trunk—so common in gum trees—will result.

At Plate CI. the correct method of making a cut to remove a large limb is shown. Of course the section should be made close to the junction of the limb with the stem, but the plate is meant to show how simply the splitting down of the wound may be avoided. First a saw cut is made at A, on the under side, then the upper side is sawn through at *b*. After the limb is removed a second cut is required directly over *a*, to remove the damaged end and facilitate the healing process.

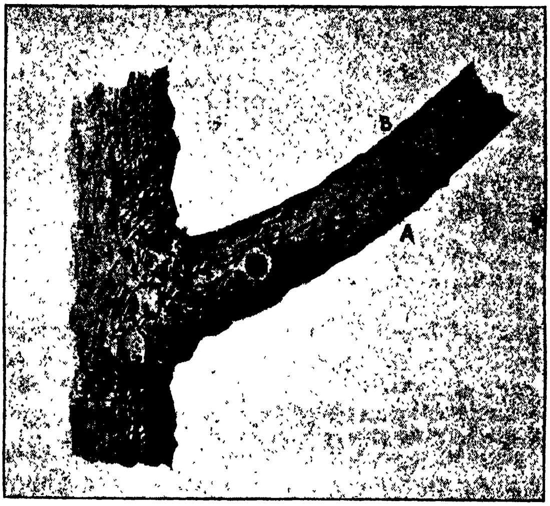

PLATE CI.—TO PREVENT A WOUND SPLITTING. (AFTER BAILEY.)

The greatest importance in the study of the healing of wounds must be given to their positions upon the tree, aud the manner in which they are made. In the case of a large wound, however, the healing of which under favorable conditions occupies many years, there are other causes of failure to be reckoned with.

Although not strictly connected with the operation of pruning, the after treatment of large slowly-healing wounds is of sufficient importance to warrant the inclusion here of a short digression upon the subject. As we have noted previously, the central woody layers which form the main body of the trunk or limb are practically inactive, though protection from outer influences apparently retains vitality within them. When a section is made through one of these this non-growing portion is exposed to the action of the elements, and organised bodies soon start to reduce the complex stem back to the more simple chemical elements from which it has been built up by the vegetative functions possessed by the parent tree. As soon as the surface of this inner wood is exposed, it loses moisture if the sun is powerful, or absorbs moisture if the atmosphere is thus charged: in other words, it begins to dry out or absorbs moisture, just as the prevailing weather determines. This process gives rise to oxidation, or, as the gardener would term it, " dry rot." Very soon germs of bacteria find a lodgment, and enter upon the work of changing the nature of the wood. Closely upon these follow larger organisms which accelerate decay, such as the saprophytic fungi or dead wood moulds. Gradually wood-burrowing grubs and caterpillars find an entrance, followed by ants; and soon larger animals, such as, in the case of our gum trees, birds and opossums, complete the destruction by hollowing out habitations for themselves. This is in short the process of nature, which condemns the weakly and unfortunate.

The object of the pruner is to avoid this process by circumventing these prominent factors of decay. In the first place he makes the wound in such a position and manner, and at such a season, as experience teaches will favor the most rapid healing of the wound. A section made in a sloping manner to carry off moisture, and not facing the sun if avoidable; a clean smooth cut without bruises on the margin; and a dressing calculated to prevent the entry of destroying agents, fulfil what is required.

For all purposes knife, seccateur, or saw, should be kept as sharp as possible. Immediately the wound is made it should be cleaned of saw dust or dirt, and dressed. If this is done the condition of the weather at the time is of little consequence. If no dressing is used, wet cold weather should be avoided in making large wounds. Cleaning the edge of a saw wound with a sharp knife is not necessary if the saw is sharp and the pruner careful.

Many kinds of dressings have been used and tested, but two, which are readily obtained and easily applied, are common oil lead paint (old rejected stuff will do), and tar. Of these preference should be given to the paint, as tar is—when exposed to the sun—likely to burn the healing callus. These dressings have the advantage of retaining a closer hold upon the dressed part than any form of wax, shellac, &c., and do not peel away after a season or so. They are also antiseptic, a quality not possessed by the others. It should be clearly understood that none of these dressings are healing in their nature. but simply ward off decay until the wound in the tree is healed over by the growth of its own callus.

Fruitgrowers who have to contend with fungus diseases, and practice spraying with Bordeaux mixture, would do well to spray with this fungicide immediately after pruning, so that the wounded sections might be coated with the mixture, as it possesses antiseptic qualities.

ORCHARD NOTES FOR JANUARY.

By George Quinn, Horticultural Instructor.

The fruit harvest will be in full swing as the month proceeds, and the disposal of rapidly ripening crops of fruits which must be dealt with at once is often a more preplexing problem to the orchardist than their production.

Slowly, but surely, growers are beginning to realise that a change in the methods of distribution is desirable if the consumption is to increase. The producer and consumer must be brought into closer touch. I have recently heard that a parcels delivery firm in Adelaide has arranged with several growers to handle their produce and deliver direct to consumers from day to day, at current prices.

This is a step in the right direction, and if persisted in, no doubt will be largely patronised by suburban residents.

The budding of all kinds of fruit trees will be in full swing during this month. Unless some unusual contingency (such as arise from unsuitable soils or climatic conditions) has to be met, each kind should be budded upon its own natural stock, that is, peach on peach, apricot on apricot, and so on.

The great essential to success is that the sap shall be flowing freely in the stock—the portion with roots—and the plant from which the "buds" are to be cut. It must of necessity be free in the stock to allow the bark to be separated readily for the purpose of inserting the shield of the bud. The operation should be performed quickly, to avoid drying out of the sap from the temporarily exposed cut sections of bud and stock. I take it for granted that the methods of cutting the buds and making the incisions in the stocks are well known. In selecting buds always procure them from trees that are healthy growers and prolific bearers of regular crops of first-class fruit.

The growth resulting from a bud will exhibit the characteristics of the parent plant from which it was taken. The vigor of growth and size of the fruits may be improved or depreciated by the action or inaction of the stock, but the habit of fruitage will almost invariably remain unaltered. The after attention to the buds is of importance. About ten days after insertion the petiole or leafstalk of the bud will indicate, if gently bent downwards, whether the "bud" has united with the cambium of the stock. If it breaks away readily at its base the desired fusion has taken place, and the binding material should be loosened slightly to prevent constriction of the expanding stem. If the leafstalk is tough and refuses to part from the bud, it is fairly certain that the bud is dead. The binding should be removed at once, and if necessary fresh incisions made and new buds inserted.

The summer pruning of apple and pear trees will be done on the plains towards the end of January. Of the different methods applicable to young vigorous trees I prefer fracturing the laterals just as the sap begins to decline. This should be done just above the second bud from the base of the shoot, and the upper portion be allowed to hang alive from the fracture until next winter. This checks the rampant growth of the lateral and causes the formation of short spur-like growths from the buds near its base.

If it has been neglected previously peach trees could be thinned out now by methods explained in an illustrated article published in our November issue, but care must be taken not to rob the fruit of much of its food-producing foliage at this stage.

I would caution amateurs who desire to admit light into the trees against indiscriminate shortening in of the shoots of the peach, as the difficulty will most probably be intensified thereby. Far better to thin out by removing shoots completely. Citrus trees may be transplanted still, provided a ball of undisturbed soil can be lifted with them, in which most of the roots are located. These should receive a good soaking immediately after being set out, and a mulch of litter or stable manure will assist them over the summer. If the ball of soil breaks the tree should be shaded overhead for a time. A piece of bagging stretched over four stakes will answer. If the stem of the tree is exposed to the sun, loosely wrap it in bagging or straw to afford shade and prevent scalding.

Scale insects are now breeding freely, and a resin spray of 10lbs. resin, 10lbs. washing soda, 5lbs. soap, boiled and diluted to make 50galls. of wash, is a good remedy.

The trees should be well supplied with moisture at the roots before applying this wash. Sprayings of Paris green or arsenite of soda for codlin moth should be continued on late apples or pears, at intervals of fourteen days. All apple, pear, and quince trees (and any other sort closely adjoining these) should be bandaged to trap the larvæ of this pest. These bands must be examined once a week to obtain best results, and prevent the caterpillars transforming to moths again. The ground around the spread of these trees should be cleaned up to remove all cover for crawling caterpillars which leave the fruits.

When gathering apples and pears for marketing care must be taken to exclude infested fruits, as the law in this colony makes the seller liable to a fine. All fallen fruits should be gathered up about twice each week, and destroyed immediately or treated to kill any life inside them before making any use of the fruits.

Late peaches will still be improved by liberal supplies of moisture and food, given by steeping the soluble products from stable manure, as described in last month's notes. As the various fruits come into market the householder who desires to preserve by means of canning or bottling should secure the required quantity. The process is so simple and inexpensive as to bring it within the reach of almost everyone, and the advantages to the health of the consumer and the furtherance of the industry are paramount.

A clear and concise pamphlet on the subject of the utilisation of fruits and vegetables may be obtained free at the office of the Agricultural Bureau.

NOTES ON VEGETABLE-GROWING FOR JANUARY.

By George Quinn, Horticultural Instructor.

Successional sowings of dwarf beans can still be made. If the soil is very dry a good soaking should be given to it several days beforehand. As soon as the soil is workable cultivate it deeply and thoroughly before drilling in the beans.

Growing crops of beans should be watered freely; in fact, in well-drained soil almost any quantity of water may be applied to them without injury. Great care must be observed in keeping the pods picked off before seeds grow in them; otherwise the blooming period will soon cease. Where not already staked, runner beans should be attended in this direction before the leading growths twine around each other.

All kinds of plants of the melon family require abundance of water now, and mild doses of liquid manure are valuable in promoting growth.

Sowings of carrots and parsnips may be made where plenty of water is available, and former lots should be thinned out as required, giving each plant 3in. or 4in. clear space to develop its fleshy root.

Tomatoes require plenty of water, and every care should be taken to keep the plants off the earth. In commercial gardens this is hardly practicable on a large scale, but keeping the fruits from lying on wet soil will be the happy medium. This is easily achieved by making the irrigation channels out of the spread of the branches.

Continue sowing lettuces, cresses, and radishes for salad purposes only in cool damp spots.

The harvesting of onions will be continued in many parts, and care should be taken to avoid bruising. These should not be put into sacks or large heaps while still containing much surplus moisture on the base of the leaves, but be allowed to dry—not sun scalded –a little before storing. This will prevent decomposition to a very great extent.

Preparation should be made now for raising young plants for setting out in autumn. Beds made by forming a shallow pit in which the soil is either enriched with well-decomposed farmyard manure or replaced by rich new soil will suffice. The surface should be as level as possible to prevent the soil washing to the lowest side. Cabbages, cauliflowers, lettuces, onions, celery, and kohlrabi are readily raised in this manner. A calico, canvas, or lath shade should be used as protection from the sun. Excepting in very early localities the end of the month is well suited for making these sowings.

The soil should be kept stirred around all crops, and around root crops such as parsnips, carrots, and red beets a fairly deep stirring is necessary where water is used freely. If this is not done the hard setting of most soils will distort the roots considerably.

In small gardens the surface soil should be mulched with stable manure between all crops in order to secure the best results.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J Perkins, Government Viticulturist.

It has become pretty certain that the new century is not to be ushered in under the auspices of a phenomenal vintage. What original anticipations in that direction may have been entertained by vinegrowers and prophets were definitely set at rest by the late disastrous October frost. And yet it cannot be denied that this untoward accident has been used by the alarmist with more effect than judgment. The future was painted of a far deeper hue than need be—the crops of whole districts were destroyed; the vintage was reduced to *nil*, &c. Now that the hubbub and cry of the pessimist has somewhat subsided we are able to discard the eye of imagination for that of common sense, and reckon up our position as it really is, and not as it is painted by the fantastic views of some few of the faint-hearted. For several reasons the 1900 vintage cannot be expected to come up to those immediately preceding it; but it does not follow that it will be altogether below respectful consideration. Some whole districts practically escaped the effects of the frost. Of such are the Adelaide and Southern districts; in others the plants were but slightly affected, and in none has the crop been completely swept away. Heavy individual sufferers might of course readily be quoted. Some few unfavorably placed, low-lying vineyards, with all prospects of 1900 harvest completely destroyed, there undoubtedly exist. Without exaggeration, however, it may be said that the large majority of the 1899 flower bunches escaped the effects of the frost. Unfortunately frost alone is not the only factor militating against the abundance of our approaching vintage. In many districts unusually unfavorable weather obtained during the blossoming of some varieties. The end of October and beginning of November was characterised by cold, sleety days, eminently unfavorable to the setting of the fruit; even such reliable varieties as Mataro and Doradillo have suffered in places, and the straggly condition of such habitual offenders as Muscatel, Malbeck, Crystal, Black Prince, etc., is even more apparent than usual. Luckily the cold winter and spring considerably retarded the bursting of the flower buds, so that in most districts their expansion took place under the auspices of the more genial mid-November days.

There is a still further factor that will have to be taken into account in any estimate of the coming vintage. It cannot be denied that in many districts the habitually reliable Mataro is but poorly laden with fruit. And it is certainly not unfavorable flowering weather that is alone to be blamed. From the very outset the number of flower bunches appear to have been abnormally small. This is a fact that does not afford of very easy explanation; it may, in fact, be the result of many variously contending factors. It may, however, be taken for granted that it is not the present season or the present season's work that is at fault in this case. The flower bunches that burst into view with the first opening of the buds are the produce of the previous season's work; the ripe wood at the beginning of winter holds already in embryonic form the whole of the incoming season's crop. And according as the past season and prevailing conditions have been favorable to the formation and development of these buds, so will the incoming season's crop be good or mediocre. It must be remembered that to a very great extent the year's crop fights with the buds, and consequently with the future year's crop, for the possession of the sap of the plant. Years of average crops may usually, therefore, be followed by good or average crops; but years of abnormally heavy crops that monopolise to an undue extent the sap of the plants at the expense of the buds are rarely followed by anything but mediocre yields. It is significant that in such years the buds at the base of the shoot are less well developed than those situated further up, particularly if the autumn weather has been favorable to the ripening of the wood.

The smallness of the '99-00 Mataro crop must, therefore, be attributed to conditions that prevailed in the '98-99 season. These conditions may either have reference to insufficient cultivation, that hindered plant growth, or to unsuitable climatic conditions. The districts in which complaints on this score have principally arisen were somewhat severely tried by hail in 1898-99, and it is just possible that the new top growth that followed on this visitation may have hindered the development of the base buds, to which alone at the pruning season spur-pruned varieties are reduced.

In this connection a chapter in Polacci's *Viticoltura Teorico-practica*, which he calls *Carpo-prognosia*, offers food for thoughtful consideration. In this chapter he sets himself to prove that, given the authentic record of the results of a sufficiently large number of seasons under given climatic conditions, it is possible to foretell with a great degree of certitude at the end of a season whether the incoming vintage will be heavy, average, or light. His own personal work in this connection was carried out in the well-watered districts of Northern Italy, and therefore I am afraid the lines on which his prognostications are based would not hold good under our totally different climatic conditions; in fact, he fully recognises that for drier Southern Italy independent research alone could establish reliable data of a similar order. On the whole, however, the result of his investigations, which are backed up by a wealth of unimpeachable statistical evidence, may be summed up as follows:—Conditions promoting good growth in spring and summer ensure a good vintage for the following year; unfavorable spring and summer seasons are followed in the succeeding year by short vintages. In Northern Italy a hot dry spring and a hot dry summer are the best guarantees of a heavy vintage for the following season. Judging solely from analogy, one would be tempted to state that the reverse would prevail here. It is a question, however, worthy of further investigation.

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January, excepting in those vineyards given to the production of early table grapes, should be a month of rest and quiet. Should heavy thunderstorms visit us during the course of the month, as is occasionally the case, the scarifiers may with advantage be run over the soil to break up the surface crust; otherwise the vinegrower can do little or nothing towards augmenting his yields. The fruit of our past toil, such as it has been, strenuous or relaxed, is now before us. We have but to reap the fruit of the labor we have sown.

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I note that an International Congress of Viticulture is to be held in connection with the Paris (1900) Exhibition from the 13th to the 16th of June. The subjects set down for discussion are the folllowing:—

1. Reconstitution of vineyards.
2. Diseases of the vine.
3. Diseases of wines.
4. Wine in relation to health.
5. The establishment of a universal ampelography.

As occasion arises I shall endeavor to keep South Australian growers *au courant* of such matters of interest to them that the discussions may bring out.

THE PHYLLOXERA ACT.

After several years' delay, the Phylloxera Act has now been passed, and comes into operation on December 31, 1899. The Act provides for the establishment of a board, of a vignerons' roll, and of a fund to be levied upon winemakers, distillers, and vinegrowers. The provisional board consists of Messrs. T. Hardy, G. F. Cleland, H. M. Martin, W. P. Auld, H. Buring, B. Seppelt, M. W. Holtze, and A. J. Perkins, and is to hold office until March 31, 1900, when a new board, partly elective and partly nominated by the Minister of Agriculture, will take office. For the purpose of securing the representation of the different districts on the board, the colony is divided into six districts, viz., Reynella, Tanunda, Angaston, Central, and Nos. 5 and 6 to cover portions of the colony not included in the four named districts. Each district will return one representative to the board. Members will be elected for two years. but the first elected board will retire two of its members each year. Each elector votes in respect to one district only, and will have one vote if he holds from one to ten acres of vineyard, two votes if more than ten or not less than twenty-five acres, three votes if the area is from twenty-five to fifty acres, and an additional vote for each additional fifty acres or portion thereof.

The owner of every vineyard of one acre or more in area must, on or before January 31, 1900, furnish the secretary of the board with a return, showing name and address, area of vineyard, age of vines, and the section, &c., on which the vineyard is situated. From these returns the vignerons' roll will be compiled. Owners of new vineyards are also required to furnish returns from time to time to keep the roll complete.

Funds for the administration of the Act are to be raised by rates on vineyards exceeding one acre in extent. At 2 years old the vineyard may be rated to the extent of 3d. per acre per annum, at 4 years 6d. per acre, and at 8 years 1s. Every winemaker and distiller will have to pay a rate of 6d. per ton of grapes purchased. Rates will be payable at the office of the Commissioner of Taxes on 1st May of each year from May 1, 1901. When the funds in hand reach the sum of £5,000 rates may be reduced or suspended.

The board has power to appoint inspectors (every member of the board will be an inspector *ex officio)*; make necessary regulations for carrying out the Act; quarantine any area within a radius of two chains from any spot where the disease, *i.e.*, phylloxera, is or is suspected to be until the nature and extent of the area affected is ascertained; to destroy all vines within the quarantined area, and to take such other precautions as may be deemed necessary to prevent the spread or continuation of the disease; to destroy unused or abandoned vineyards.

Compensation will be paid upon the board's recommendation to any person entitled thereto in respect to any vineyard or portion thereof destroyed under the provisions of the Act, and in respect to persons, gardens, orchards, or produce injuriously affected by the action of the board, such compensation to be assessed by the board on the basis of the actual damage sustained. No compensation will be paid in regard to any vineyard unused or abandoned for a period of two years prior to destruction.

A penalty of not more than £50 is provided should the owner or occupier of any vineyard reasonably suspected to be attacked by phylloxera wilfully neglect to immediately notify the board or its officers of the fact, besides forfeiting his right to compensation. Any person hindering an inspector in the execution of his duty, or neglecting to make the returns required by the Act, or making a false return, or violating any proclamation or regulation under the Act, is liable to a penalty of £5, in addition to any penalty provided in the Act. Every person selling vines or portions thereof affected by the disease is liable to a penalty of not exceeding £50, unless he can show that it was not possible to discover the fact by reasonable care. Except with the sanction of the board, no vines shall be planted or be permitted to grow in any land from which diseased vines have been removed for a period of ten years from such removal.

The Governor may, by proclamation, forbid the removal from any place within the colony of any vine or grapes, package, implement, or thing likely to convey the disease; may declare any land or building a quarantine for the reception of any vines or grapes diseased or suspected to be diseased; quarantine any vineyard, building, or place where any diseased vines or grapes may be found or may have recently been.

POULTRY NOTES.

By D. F. Laurie.

I am in daily receipt of questions *re* poultry ailments, which seem inseparable from this season of the year. I suppose the fact that poultry are more susceptible to disease than other stock emphasises the fact that general attention to sanitation and hygiene is to a great extent overlooked. It is no credit to a breeder of any stock if his birds or animals have sufficient stamina to hold out against disease. Errors in feeding account for a great deal; unsound stock as breeders accounts for more; but, on the whole, neglect in the observance of the simplest laws of sanitation account for the bulk. On more than one occasion it has been the duty of the writer to bring clearly before readers the great importance of this subject. Unhappily certain diseases are transmissible from poultry to human beings, and *vice versâ*. This fact is not generally recognised. Neglected poultry are very prone to contract some one or other of the different forms of diseases generally grouped under the vague term of roup. A very prevalent form of this disease is undoubtedly diphtheria, and it has been abundantly proven that it is inter-transmissible between poultry and human beings. Such being the case it is patent that the authorities should move in the matter. At certain seasons of the year suburban poultry yards fairly reek with some form of this dread malady, and there is little doubt that many a child suffers in consequence.

Victoria has legislated against the poultry tick (Argas reflexus); Dr. Brown calls it Argas Americanus, or the Mexican poultry tick. There is little doubt that importations of poultry from India are responsible for the introduction of this, our greatest, curse. Sooner or later some restrictions must be placed on the reckless harborers of this scourge. Our Victorian friends are still innocent of actual knowledge of the subject, and even question the fact that tick live on the bodies of the birds throughout the day. The idea that ticks only visit poultry at night and retire to the crevices of the poultry house during the day is a fallacy—they do both. Poultry-breeders in general would welcome an edict forbidding anyone to keep poultry who is unable to show a clean bill of health. I have a letter from a suburban resident whose dwelling was invaded by poultry tick, and he failed to find a legal remedy against his unjust neighbor. We have an unrivalled climate for poultry, but we have diseases and pests to deal with which might easily be stamped out.

Poultry will pay well if a few common-sense ideas were adopted. We must have decent shelter, and fresh clean drinking water and green food are absolute necessaries, and also a little general supervision.

The young stock should be in a forward state now, and there are certain things to be considered. Separation of the sexes is very desirable, and helps one very considerably in the management of large flocks of poultry. Caponising is one of the dead arts as regards utility; there is absolutely no need for it. What we want is that all poultry-breeders should confine their attention to standard classes, so that where egg production is the main point in view they should be advised as to the most prolific varieties, and where table poultry are to be bred, either for local consumption or for export, only those which are of the highest class should be bred.

The Douglas mixture is excellent for use at this time of year. Take ½lb. of copperas (sulphate of iron), place in an earthenware vessel, and pour 1gall. of boiling water over it. When dissolved, add a fluid ounce of sulphuric acid and thoroughly mix; bottle then for future use. To each quart of drinking water add a tablespoonful of the mixture; to be given three times a week, or daily if disease is present. Do not use any metal utensils for the drinking water. A little Epsom salts may be mixed with the soft food once a week during hot weather, say a packet for twenty grown birds.

FARM HINTS FOR JANUARY.

By the Editor.

In the South-East and the cool hilly districts grass seeds should be sown during February or March, but the land should be prepared at once by ploughing and harrowing to a fine tilth. A mixture is much superior to a single variety for grazing purposes. For each acre procure at once, say, various fescues, 10lbs.; cocksfoot, 5lbs.; perennial rye grass, 3lbs.; Italian rye grass, 2lbs.; foxtail, 3lbs.; cow grass, 2lbs.; and mixed trefoils, 3lbs.

Lucern in its earliest stages is very susceptible to injury from frosts; therefore it is necessary to study the peculiarities of each locality where it is proposed to sow it. The land should be thoroughly well prepared and worked down level and to a fine tilth some time before sowing the seed. Sow late in spring, or early in autumn (say end of February). Sow with a drill, not more than 1in. deep, on fine, light, rich, deep soil, and run a light roller over at once to press the soil upon the seed. If the soil is rather inclined to be heavy, sow only ½in. deep. When the plant is strong enough use the harrows to loosen up the surface. Sand lucern (Medicago media) is less exacting in regard to moist soil than M. sativa (or common lucern), and thrives well upon sandy soils.

The only way to improve the character of animals or plants is by selection and re-selection—culling and rejecting all inferior types—until there is no hope of further advancement. Sorghums, maize, &c., will rapidly deteriorate unless the best are regularly selected every year.

A few farmers from time to time have profited from sowing seeds of white mustard and rape—about 3lbs. of the latter and 4lbs. of the former to each acre—on stubble land, and then harrowing it in. Land that has grown a hay crop or that has been reaped with the binder will suit best. The plants come away after the first rains, grow rapidly, and sometimes stand 3ft. high whilst all other vegetation is dormant. This, of course, is not always the case, but there will be some green feed for the live stock at a time when they most want it. The land will be enriched too, and mellowed and cleaned, provided the mustard is not allowed to produce seeds.

Those who neglect to thatch or otherwise protect their stacks have only their own neglectfulness to blame when the rain gets in and spoils the hay or grain. Some farmers use galvanized iron and other substitutes for thatch. Clear a good space around to prevent grass fires getting in.

It is a pity that sunflowers are not more cultivated. Very many thousands of acres are under sunflowers in various parts of the world, and they pay well. From 40bush. to 50bush. of seed per acre is a fair average on good soil, but up to 90bush. per acre have been grown in Victoria. A bushel of seed gives 1gall. of excellent oil and about 30lbs. of cake, valuable for feeding to live stock. The dry leaves are much liked by horses and cattle, and the seeds, given in moderation, are fattening and give gloss to hair and feathers of live stock and poultry. The sunflower heads should be cut and carted to a shed, where they should be dried on hurdles or racks. If placed in heaps or on the ground they will become mouldy and spoiled. Sunflower seeds are worth 6s. to 8s per bushel. The crop requires a large quantity of potash.

At first opportunity deeply plough and bring to a good tilth an acre or two acres of good land, to be used for growing vegetables and fruit. There is no necessity to depend upon the stale refuse from the hawkers' vans when you can grow first-class produce at your own door.

The following figures may, perhaps, show up the folly of burning the straw. One ton of straw burned will yield 50lbs. of ashes, most of which will probably be blown away. Those ashes would contain about 5lbs. potash, 8ozs. soda, 3lbs. lime, 3lbs. magnesia, 1lb. oxide of iron, 1lb. phosphoric acid, 1lb. sulphuric acid, 1lb. chlorine, and 35lbs. silica. The fire has destroyed about 166lbs. of nitrogenous food, 143lbs. albuminous food, and 900lbs. of starch, sugar, gluten, oil, &c.

There is labor involved in harvesting straw, just as there is in everything else; but when one sees soil impoverished for want of decayed organic matter, and live stock dying from starvation. there is good reason to conclude that the labor would have been well employed in averting those disasters, even although there may be no immediate pecuniary return for the work. The lessons taught by the last seven years of drought ought not soon to be forgotten.

Phosphatic manures are equally beneficial on pastures and cultivated fields in most parts of the colony. Where wheat stubbles remain after a crop manured with phosphates the cattle and horses leave good grass and other pastures to graze upon the stubbles. It is very probable that much of the sickness amongst cattle in certain dry districts is partly attributable to the want of sufficient phosphates in their food; indeed, some farmers claim to have proved this to be a fact by practical experiments with superphosphate on their pasture lands.

Stock taken off dry pastures, or very hungry stock, and placed upon green succulent food will most probably get blown within a few minutes. They must be introduced little by little to such food. If a beast gets blown give at once a tablespoonful of carbonate of soda in a wine bottle of water.

Those who keep cows and raise lambs for export cannot afford to neglect ensilage. Cows cannot give enough rich milk unless they receive or get succulent food in plenty, and ewes cannot suckle lambs fit for export without a liberal supply of nourishing food. This supply can be ensured if there is a good lot of ensilage in pits, and labor may be saved if green crops can be grown for summer and autumn grazing. The latter, however, is a contingency, whilst the filled silo is a certainty; therefore put down as much silage as possible, and at the same time try to grow some green crops.

CULTIVATION DOWNWARDS.

Since time immemorial deep cultivation of the soil has been most strongly advocated by practical and experienced agronomists; but there still remain many wheat-growers who maintain that deep cultivation is injurious to the land and ruinous to the crops that are to be grown upon it. Probably the difference of opinion may be due to the application of the principle. The first-named party proposes that the land shall be broken fine to a considerable depth, but that the subsoil should be left below, fairly well packed (not in rough, coarse clods), and that the surface soil shall remain on the surface, but turned over to depths varying from 4in. to 12in., according to its nature and texture. The objecting party, perhaps, would turn the whole soil topsy-turvy, or else leave the sub-soil broken up in rough clods, or otherwise ill-prepared. Any gardener who would dare to say that shallow cultivation preserves a scanty rainfall, or is suitable for growth of vegetables or fruit, would be regarded as an eccentric, and would certainly fail to grow marketable crops; but there are a few farmers who say in a dry spring the rain would sink too deeply in a well cultivated field to allow of the roots of the cereals to reach the moisture. This contention, of course, is almost too absurd to be entertained by the great majority of practical men, but it shows a necessity for constant iteration and reiteration of lessons that have been learned by practical men for ages past.

An agricultural writer, some twenty years ago, repeated the fact that experience had fully demonstrated that one acre of land thoroughly pulverised 12in. deep would invariably bring a better result than three acres cultivated only 4in. deep, and it would not cost as much to cultivate the one acre as it would to do the three acres. Even if there is a deficient rainfall, there would be more moisture conserved—(and *absorbed* from the air)—in one acre properly cultivated to a depth of 12in. than in three acres at 4in. Several extensive tests have been made with a view to discover the quantity of moisture that will be absorbed by dry soils from the atmosphere. If 1,000 tons of soil were roughly taken up and dried in its cloddy state, and exposed to the air for twenty-four hours, it will have taken up from the air at the end of that time, of water:—

If sandy loam, 5 tons
If clay loam, 7 tons
If stiff clay, 10 tons
If garden mould, 12 tons,

That same soil, if pulverised, dried, and exposed for twenty-four hours to air, would take up moisture as follows:—

If sandy loam, 26 tons
If clay loam, 30 tons
If stiff clay, 36 tons
If garden mould, 45 tons.

Fifty tons of water is equal to ½in. of rainfall on an acre of land. These experiments were tried in a colder climate than that of South Australia. Hot air contains more and more moisture as it gets hotter, provided there is moisture to absorb as it expands with the heat, and upon entering the loose soil it becomes cooled, and parts with the excess. When rains fall the whole of the water sinks into the loose soil, and with the rain comes ammonia and other enriching matters that were contained in the air. If the soil is not thoroughly pulverised and to some depth, the chief part of the rain runs over the surface, dissolving a good deal of soluble fertilising matter and carrying it off to the nearest stream, where these valuable constituents are lost altogether.

The following are good reasons for deeply and thoroughly working the soil, of course leaving the sub-soil in its original position, but still pulverising it:—

1. It gives full scope to the roots of plants so that they ramify the whole of the soil, and can therefore supply food and moisture more effectually than when the soil is hard and the roots much less branched and fibrous.

2. It admits air to the fine rootlets; without air at the roots no plant can have healthy growth.

3. It regulates temperature in the soil by maintaining an equal warmth, so that the plants grow strongly; also admits the rain freely, and the soil does not become super-saturated in a deep loose soil.

4. It enables the soil to absorb large quantities of fertilising gases from the atmosphere.

5. In very wet weather the excess water, if any, rushes to the bottom and escapes below.

6. The admitted air, moisture, and gases tend to rapid decomposition of organic matter in the soil, thus speedily converting it into plant food.

Where the soil is shallow, with perhaps limestone rubble beneath, it may still be worth while to stir up the rubble, but it must be compacted again else the excessively loose subsoil will absorb all the moisture from above as well as from below.

THE CODLIN MOTH.

Report of Select Committee of House of Assembly.

The Select Committee appointed by the House of Assembly to inquire and report concerning the codlin moth regulations has finished its labors. The result of its deliberations is as follows:—

1. Your Committee have to report that from the evidence taken they find that in most fruit-growing districts in this colony the codlin moth exists, and there is a strong desire on the part of the growers to check the spread of the pest, which is believed to be practicable; but fears are expressed by the majority of the witnesses that it is impossible to eradicate it.

2. There are a few clean districts, in which the growers naturally desire to take every precaution against the introduction of the codlin moth. In such districts the feeling is to rigidly observe and enforce the regulations as now existing, especially as to prohibiting the sale of infected fruit.

3. It has been suggested to your Committee that, as a further precaution, local bodies should be appointed in clean districts, with power if necessary to prevent the introduction of any fruit into their districts; but your Committee

cannot make any recommendation in this direction, as there are too many difficulties in the way to render it reasonably practicable.

4. Generally the growers show a desire to do all they can to keep the pest in check, and are willing to observe all regulations that are practicable or can reasonably be given effect to. Your Committee feel that what might be practicable under some conditions would be altogether impracticable if applied to other cases, as age of trees, size, and situation have to be considered, and in such cases due allowance should be made by the inspectors.

5. The petition presented to your Honorable House, signed by 588 fruit-growers and salesmen. together with other petitions, as appear in appendices, have been carefully considered by your Committee, and while the subject is surrounded with some difficulty, yet your Committee find on the whole that the inspectors and officers concerned in the execution of their duties have discharged such in a fair and reasonable manner, and have not caused unnecessary hardship to growers.

6. As pointed out by the petitioners. it appears desirable that some amendments of the present regulations should be made without in any way endangering the object of preventing the spread of the pest in the colony, and your Committee recommend the following amendments of the published regulations:—(*a*) That sub-section I. of clause 5, relating to spraying, be struck out. (*b*) That sub-section II. of clause 5 be amended so as to read as follows:—"In each year, between the 1st day of June and the 1st day of September, or at such times as an inspector shall direct, scrape off all rough dead bark from the trunks and limbs of every tree thereon, and clean all crevices in the bark and forks of every such tree into or on to bagging or other suitable material, and shall destroy all such scrapings by fire." (*c*) That sub-section III. of clause 5 be amended so as to read as follows:—"In each year, between the 1st and 31st days of October, or at such other time as an inspector may direct, fasten a band of suitable material, with two folds, around the trunk of each tree, or each branch near to its junction with the tree, each fold to be not less than 4in. in width, and (*a*) after fastening each band, and until the same is finally removed, unfasten, examine, and replace such band every seventh day, and destroy all larvæ and pupæ therein or thereunder; (*b*) between the 1st day of June and the 31st day of July, or at any other time an inspector may direct, finally remove each such band, and cleanse or destroy it in such a manner as an inspector shall order." (*d*) Sub-section IV. of clause 5 amend so as to read—"Gather all infested fruit, if so directed by an inspector, and all infested fruit that shall fall from each tree weekly, and destroy such fruit, or treat the same in a manner approved of by an inspector, so that all larvæ therein or thereon shall be destroyed." (*e*) Sub-section V. of clause 5 to be amended so as to read—"Clear and keep clear the soil under and near each tree of all foreign matter which, in the opinion of an inspector, might prove a shelter or harbor for the codlin moth in any stage of its existence."

7. As to the sale of the fruit infested with the codlin moth your Committee cannot recommend the repeal of this regulation, but recommend that a regulation be framed and sent out in addition to the other codlin moth regulations to the effect that the inspectors have power to allow the sale of fruit in which the caterpillar of the codlin moth has been destroyed, their written consent being first obtained.

8. It having been pointed out by some witnesses that the want of proper attention to the storehouses is often a cause of the spread of codlin moth, your Committee would therefore urge upon the growers, fruiterers, and fruit-preservers, in their own interests and in the interests of the community, to see that no oversight occurs in this matter of such importance, by the proper construction, so as to effectually admit, if necessary, of periodical fumigation.

9. Fruit cases and bags are also a frequent cause of the spread of the codlin

moth, and as a remedy and safeguard your Committee suggest that the fruit-preservers and jam-makers should make provision for cleansing, by scalding or in some other effectual way, all fruit cases and bags that pass through their hands.

MULTIPLE ABSCESSES IN SHEEP.

By C. J. Valentine, Chief Inspector of Stock.

The following extract from a report made by Dr. Brown to the Stock Department in Melbourne is of much interest to owners of sheep in country which is favorable to the development of the disease. Wherever the country is favorable for footrot there abscesses may be looked for, and I shall be glad if any specimens are found they be forwarded to the Stock Office for investigation.

A disease of bacterial origin, and associated with certain tracts of country, seems to be making considerable headway in Australian sheep; it, however, is not highly contagious. The contagion is derived from the ground, and can only invade the animal when its cutaneous investment is injured. The disease evidently has not yet received much attention, as it obtains no prominent place in pathology. It was first described under the name of pseudo-tuberculosis by European pathologists. It, however, is a disease quite distinct from tuberculosis, and some care in its nomenclature is necessary, so as not to lead to any confusion. How it came to be introduced into Australia is as yet a mystery, but that it did come from Europe is indisputable. In July, 1898, I first brought this disease under the notice of the department, and pointed out its specific character. Six years ago the disease was practically unknown, but about five years ago its presence began to be remarked. The disease is characterised by swellings which vary much in size, and which occur in the lymphatic glandular system. Rarely is any other organ attacked. The tumors vary in size from that of a plum to that of an orange. As a rule the disease is not detected until after slaughter, as it is not usual in the later stages for any symptoms to be manifested on the part of the animal. Manipulation would not fail to discover the swellings, but manipulation is not practised before the purchase of sheep.

On section at an early stage the nodules disclose a more or less tough fibrous capsule enclosing a greater or less amount of viscous material. At a later stage the contents are firmer and more friable; sometimes, indeed, the contents are quite firm and solid and arranged in layers. The contents usually possess a distinct green color, or there may be various shades of green.

No class of sheep is exempt from the disease, which prevails mostly on stations that are of a marshy character, or that are subjected to occasional floods. Places where footrot prevail are also places where multiple abscesses obtain a foothold. Certain stations are known for the sheep afflicted with the disease. The disease is occasioned by micro-organisms which enter the lymphatic vessels through breaches in the continuity of the skin.

Sheep inoculated either in feet or groin or axilla become lame. An abscess soon forms in the nearest lymphatic glands, and the animal s are very sick for about ten (10) days after. They refuse to eat, and lie about, seeking a shady place in which to recline. They are very weak. There may also be a considerable amount of suppuration around the point of inoculation. The temperature may rise to 107°. A large quantity of fresh pus may be inoculated without producing a fatal result, but stale pus produced death in two instances within seven (7) days. The pus had been kept in the freezing chambers some months, and had been allowed to thaw in the sun before using it. Cultures from pus derived from guinea pigs or sheep suffering from the disease or pus from abscesses of freshly-killed sheep or guinea pigs did not produce fatal results in four other cases. Four sheep were killed eight to ten weeks after inoculation, and were, all things being considered, in fair condition. Single abscesses had formed in glands nearest seat of inoculation. The primary sores had healed up, it was observed, about three weeks after inoculation.

In fowls and pigeons a disease much resembling multiple abscesses of sheep prevails naturally. It is not uncommon to find large caseous tumors in various parts of the bodies of fowls and pigeons. The micro-organism that causes the disease in fowls and pigeons differs morphologically from that causing multiple abscesses in sheep. The micro-organisms that cause the disease in sheep are derived from the ground on which they pasture, or over which they travel. The germs inhabit the soil. Any wound or abrasion in the neighborhood of the feet leaves an opening through which the germ can invade the system. The germs from the soil enter the wound, and traverse the lymphatic vessels, until they gain the nearest lymphatic glands, where they may be effectually arrested, but where they cause the tumors noticed. The germs causing this disease vary in length from about one-eighth thousandth to about one-sixteenth thousandth of an inch. They are oval and non-motile, *i.e.*, possess no movement.

Prime sheep are often enough found affected. It is a disease which, in my opinion, is nowise injurious to man. To prevent multiple abscesses all wounds, particularly those about the feet, should receive early attention. Footrot should be early treated. Sheep on stations where abscesses prevail should once a quarter, at least, be driven through the footbaths. All wounds made by incision, either during castration or shearing, should, when practicable, be smeared with salt, and then covered over with Stockholm tar. Whatever prevents footrot assists also the prevention of abscesses. The removal of sheep from marshy lands and the drainage of marshy tracts of country arrests the spread of the disease.

I have never seen the disease in lambs, but it does occur in two-tooths. The injection of tuberculin into affected sheep does not produce a disturbance of temperature. The disease is not transmitted directly to the offspring; animals are born free of the disease and contract it from their surroundings.

The primary cause of the invasion of the lymphatic system by the micro-organisms that produce the disease is to be sought in a stab, prick, abrasion, burn, grass seed wound, or in some ulcerative condition which has been occasioned by some injury to the feet from roughness of ground. A slight wound is sufficient to admit the entrance of the virus. The primary sore heals and leaves, as a rule, no trace of its previous existence. The superficial, inguinal, and prescapular glands are most frequently affected, the virus having entered by wounds in the feet. The deep inguinal glands are not often implicated. The scrotal and pelvic glands and the mediastinal, sternal, and cervical glands may be involved.

"FINGER AND TOE DISEASE" OF TURNIPS.—In connection with the Reading (England) Agricultural College experiments have been carried out to test the various remedies for the prevention of "finger and toe disease" in turnips. It was found that the disease was worst in land poor in lime, and dressings of lime in various forms were applied. Caustic lime, gas lime, and chalk gave excellent results, especially with swedes. Thomas phosphate had very little effect. To give beneficial results the dressings must be applied a considerable time before the turnips are planted. Up to 4 tons to the acre of caustic lime and chalk, 3 tons gas lime, and 10cwts. of Thomas phosphate were applied to the different plots.

GOVERNMENT BUTTER COMPETITION.

In order to further the interests of the dairying industry, the Minister of Agriculture, upon the recommendation of the Dairy Board, offered prizes of £15, £10, and £5 for best exhibits of export butter, the conditions being that the butter was to be made as for export, forwarded to the Produce Depôt by October 14th, and stored in the cool chamber for six or eight weeks before being judged. The object of the competition was to expose the butter to the conditions it would meet with in ordinary course if exported to London, then to judge the same, note any defects, and advise the makers as to methods to be adopted to prevent the recurrence of such faults in the future. In order to make the test of greater value to those taking part in the competition, the exhibitors were requested to forward samples of the whole milk, separated milk, buttermilk, and the water used in washings, &c., and also to furnish certain particulars of the process of manufacture. The samples forwarded were subjected to various bacteriological tests by Dr. D. McDonald, of the Adelaide Hospital, and to chemical tests by the Dairy Instructor (Mr. G. S. Thomson). The results of these examinations compare very favorably with the judge's report. They are, however, being treated as confidential, each factory being advised of the various examinations of the samples forwarded, together with evidence of the faults noted by the Dairy Instructor from the particulars given by the exhibitors.

Upon the recommendation of Mr. Robert Crowe, Chief Dairy Expert to the Victorian Department of Agriculture, Mr. A. Simpson, of Messrs. Dalgety and Co., Melbourne, was asked to act as judge, and he accepted the position. The butter remained in the cool chamber—which was kept at 32° F.—for seven weeks, and then in a cool corridor for five or six days, until it averaged about 58° F. The result of the judging was that the exhibit of Mr. J. H. Yelland, of Milang, was awarded first prize, with ninety-six points; Mr. C. H. Tuckwell, of Wilmington, received ninety-four points, and second prize; while Mr. C. F. Leditschke, of Point Pass, and the Port Elliot Produce Company tied for third prize, with ninety-two points. The Clare and Onkaparinga factories received ninety-one points each, and the Clarendon factory ninety points. It is only fair to point out that the Onkaparinga factory competed under serious difficulties, their manager having died a short time before the time for receiving exhibits, consequently the butter was made by the assistants. Under these circumstances their position is distinctly creditable.

The following are the reports by the Judge and by the Dairy Instructor on the competition.

Judge's Report.

At the request of the Minister of Agriculture, I beg to advise having made a close and careful examination of eighteen lots of factory butter, consisting of three cases each, that had been placed in cold storage at your Government Freezing Depôt, Port Adelaide, for a period of from six to eight weeks, so that it might, as nearly as possible, assimilate to the temperature and length of time that usually occurs in the shipment of butter to the home markets.

Temperature.—I found the cases had been stored in a sweet clean chamber, and subjected to an even temperature of from 32° to 33° F., and, at my request, were removed from same to an apartment for purposes of thawing out; as, to test the keeping qualities, it was necessary the butter should be as nearly as possible at about 50° F.; and I must expressly thank your officers at the depôt for the able and satisfactory manner in which they carried out my wishes in this respect.

Casings.—This particularly attracted my attention, and am sorry to state I found this important matter very much at fault, as, instead of being in neat clean cases and well put together and fastened, many were old second-hand boxes with bad-fitting and broken lids, and some very dirty and stained; far below the standard requisite to successful shipping conditions for the London market.

Flavor.—I am sorry to have to report that, under this all-important feature, I only found, out of the whole eighteen exhibits, seven instances in which the fault "fishiness" did not appear to a greater or lesser degree, and attribute the cause to the fact that at the season of the year these butters were made the early spring grasses affected the milk, and that the cream after separation was not sufficiently ripened. Experience and experiments made in other colonies confirm this opinion, and may be profitably studied by your various factory managers. In the exceptional cases mentioned I found the flavor of a very high standard, which is more fully shown by points awarded under this heading in the appended schedule.

Texture.—This, which actually demonstrates the methods of manufacture adopted, I found to be of the highest standard, and in no single instance did I find cause to reduce the maximum number of points allowed under this heading to any appreciable degree; and it calls for my congratulations to the excellent work displayed by your various managers.

Color.—Here again I was very pleased, and in the majority of cases found that the so much desired tint of " bright primrose " was predominant, which is almost universally asked for by the home buyers.

Packing.—With a few exceptions another important branch of the work was found to be satisfactorily done. The boxes were carefully parchment-lined, the butter well and evenly rammed, with full weights—in some instances rather wastefully so, as by placing 58lbs. in a box the factory is actually giving away at least 1lb. in each case, as buyers insist on having 56lbs. net, and debit any shortage thereon, but will not pay for any surplus—and the recognised rule now is to put as nearly as possible 57lbs. in each box of salted butter and 56½lbs. of unsalted, as it has been proved that moisture and evaporation in the former results in about ¾lb. loss, while the latter retains its moisture when made with a preservative. The principal fault in packing arose from the faulty casings referred to, as in numbers of instances the nails had been driven into the butter, and rust corrosion marks and stains showed themselves in a number of instances.

Salting.—This portion of manufacture is a very debatable subject, and various home markets give preference to such as " mild," " light," and " full " saltings; but for the last named it has been found generally satisfactory by not exceeding 4lbs. per cent: but I came across instances yesterday that far exceeded this amount; but uniformity is an important factor, especially in regard to the mixing with a preservative, or with preservative alone, as instanced by the fact of butter so made realising highest prices on the home markets.

Points Award.—In the adoption of my points I have endeavored as nearly as possible to make the same correspond with the commercial value of each exhibit. For instance, the maximum number of points is 100; to meet the case I take as a standard of value for the very choicest Danish butter or Australian, 100s. per cwt. So that, say Z has eighty-two points as a total, the value of that lot should be worth 82s. per cwt. I also take two sets of minus points, with a maximum reduction of five—in one instance for mottle and streakiness in preference to reduction under heading of color; and in the other case for milky or clouded brine and excess of moisture, rather than off texture —these being shown in detail on the schedule.

Schedule.

Brand.	Flavor.	Texture.	Color.	Packing.	Salting.	Total.	Mottle or Streakiness.	Milky and Cloudy Brine.	Total Award.	Test Weights Taken.	General Remarks.
	Maximum Points. 50	25	10	10	5	100	Minus Points. 5	5		Net Weights.	
D	45	25	10	10	5	95	Streak — 1	—	94	Lbs. 58, 58, 57¾	Good flavor, close grain, well washed, light streaky.
S	42	24	10	10	5	91	—	—	91	57¾, 57¾	Sweet flavor, little overworked, clean, good pack and salting.
E	43	25	10	10	5	93	—	— 1	92	56¾, 57¼	Sweet flavor, badly washed, cloudy brine.
W	43	24	10	9	5	91	— 1	—	90	56½, 56¾	Sweet flavor, light streakiness, boxes badly nailed
Æ	44	25	10	10	5	94	— 1	— 1	92	57¼, 57½	Sweet flavor, light streakiness, cloudy brine.
A	46	25	10	10	5	96	—	—	96	57¼, 57½, 57½	Good flavor, clean, close, well made; parchment faulty.
B	37	25	10	10	5	87	—	—	87	57	Fishy flavor, but well made and clean.
X	35	24	10	10	5	84	—	—	84	57	Strong fishy flavor, but well made and clean.
O	37	25	10	10	5	87	—	—	87	57½	Full fishy flavor, but well made and clean.
Y	40	24	10	10	5	89	—	— 3	86	57	Sweet flavor, very faulty washing, milky brine.
K	38	24	10	10	5	87	—	— 1	86	57	Light fishy flavor, well made, but cloudy brine.
P	39	24	10	10	5	88	— 2	—	86	57	Fair flavor, but somewhat mottled.
F	37	24	10	9	4	84	—	—	84	57	Full fishy flavor, salting too high; butter not rammed.
L	35	24	10	10	4	83	— 1	—	82	56½	Strong fishy flavor, light streak, and highly salted.
J	35	24	10	10	5	84	—	—	84	57¼	Strong fishy flavor, well made and packed.
M	41	25	10	10	5	91	—	—	91	58¼, 58	Sweet flavor, well made, and clean.
N	35	24	10	10	5	84	—	— 2	82	58	Strong fishy flavor, with excessive moisture.
H	33	24	10	10	4	81	—	—	81	56½	Very strong fishy flavor and too high salting.

Report by Dairy Instructor.

In Dr. McDonald's examinations of the milks and waters, the number of germs per cubic centimetre and ten micro-millimetres have been determined, together with the species of bacteria found foreign to dairy produce. The respective values of the samples examined have been notified to the competitors. The following is an abstract from the report of Dr. McDonald:—"Twelve of the samples contained the pus group of germs, but, although infectious, they do not represent any serious disease or taint. It it quite gratifying to note that, on the whole, the forty-eight samples analysed were free from the important group of pathogenic germs which transmit disease, and, as the samples are from different parts of the colony, the same may be predicted of the produce manufactured."

Care Wanted with the Utensils.—What do the bacteriological examinations reveal? Two factories submitted buttermilk rich in unwelcome germs, against a high standard of purity in both their sweet and separator milk. No bacteriological examinations were made of the cream to determine their values, but from what I can gather in association with the test, the churns appear to be the seat of the contamination. To remove any danger of this occurring in future, it is imperative that butter-making rooms should be provided with thorough ventilation—have an abundant supply of light, and, what is very important, fit the churns with lids the full size of the top of the churn, thereby exposing every part of the inside to the influence of light and air. Again, three other factories furnished samples of skim milk of a very low bacteriolgical value when the purity of the sweet milk remained high. Are the separators at fault in those cases? Want of thorough cleanliness of the inside parts of the machines will account for the contaminated milks. All owners of separators will do well to give this matter attention.

Water.—Individual competitors will be privately informed as to the purity of the water used in the washing of the butter. It is fortunate, notwithstanding that a number of samples were rich in organic matter and germ life, that the butter did not develop a taint or flavor other than fishiness. The overwhelming strength of this predominating flavor, whether purely chemical or the result of bacterial life, is demonstrated in the test. With one exception, which can be accounted for, the bacteriological and chemical examinations of the water showed a similarity throughout.

Colostrum Milk.—Five factories provided answers showing that the condition of the inside of the separator bowls afforded evidence of the milk of newly-calved cows being used in the manufacture of the butter. Turning to the bacteriological table, I found that the analyses point to an abnormal state of the milk pus cells and germs associated with inflammatory tissue being discovered. It is perhaps of value to state that the butters of those five factories were fishy to a greater or less degree.

Butter Flavor—From Mr. Simpson's report it will be noted that the greatest weakness in the butter was the fishy flavor. The fishiness developed considerably throughout the period of chilling, as the examinations made by myself at the commencement of the test showed only faint indications of its presence. From the records of examinations of export butters the fishy flavor was noticeable in two shipments, one at the end of September and the other at the beginning of October, but since then it has apparently disappeared. As the localities are known in which the strongest flavored butters were manufactured, some information as to its access to the milk may yet transpire. From observations taken throughout the test, I am still of the opinion that fishiness is the result of a chemical change, caused through the digestion in the animal's body of certain species of immature herbage, and the flavor is intensified in the milk of newly-calved cows and by refrigeration and thawing. In our test the worst cases were from the butter made from cream ripened from twenty hours to seventy-two hours; average, forty-four hours. The butter free from the fishiness had the cream ripened from fourteen to fifty-one hours; average, twenty-seven hours. If the change is a bacteriological one, and the ferment controlled by an acid media, the high maturity of the cream, together with the long period of refrigeration, would be expected to arrest the development of the fishy flavor. Chemical examinations of the fishy butter show a strong acid reaction, and one of the best butters gives a pronounced alkaline reaction.

Separation and Butter Fat Losses.—The highest temperature at which milk passed through the separator was 160° F.; the cream being used in the manufacture of pasteurised butter, which was entered for competition. The reading of the fat in the separator milk was ·0025, the lowest of all the samples examined. The highest percentage found reached ·045, the separating temperature being 85° F. Considering the butter fat losses, 90° F. gave the most favorable results. On the whole the efficiency of the separators leaves little to be desired. The DeLaval and Alexandra were the machines used.

Cream Ripening.—In every instance the cream was ripened in cans placed in the factory room, cellar, or cool chamber. In examining the papers from the competitors it is noticeable that, of the six highest awards, four had the cream ripened in a cool cellar, one in a cool chamber, and one in a cool and well-kept room. In each case the cream was exposed to the air, no cloth being placed over the cans. I would advise, wherever possible, have the ripening done in a vat situated in a cool and well-ventilated place, away from the air of the butter or cheese making rooms. For the best six butters the hours of ripening, given in rotation, are 51, 26, 28, No. 4 not given, 14, and 20.

Degree of Acidity.—In not one instance was the acidity arrived at by other means than taste and smell. I would strongly recommend factories dealing with large quantities of cream to provide an acidity apparatus similar to that described in last month's *Journal of Agriculture.*

Churning Temperature, Period, and Losses in Butter Fat.—The sample of buttermilk showing the greatest percentage of fat was obtained from cream churned at 64° F., the highest temperature of all. The next less in extent corresponded with the second highest temperature, 62° F. The period occupied in churning gave striking illustrations of the losses in butter fat. With well-ripened cream, churned from twenty to twenty-seven minutes, the readings went as high as 1·2 per cent.; from twenty-seven to thirty-five minutes the greatest loss was ·6 per cent., the lowest, 0·175 per cent., and the average 0·25 per cent. of fat. Let us consider one example, where the period of ripening occupied fourteen hours, and the time in churning twenty-three minutes. These few hours given to ripening, and a cool cellar selected for the keeping of the cream, one would naturally expect that the condition of the cream when put into the churn would be of a low acidity. This is confirmed by the practical examinations. From the knowledge that when sweet cream is churned fast a loss of butter fat follows, in the instance given we may fairly attribute the loss to this cause, as the percentage of fat found in the buttermilk reached the high figure of 1·4. I would strongly urge the use of refrigerating machines in the factories wherever practicable, as the saving of heavy losses of butter fat throughout the summer would soon compensate for the cost of a machine.

Washing in the Churn.—Eleven factories gave three washings, four gave two washings, and one four washings. Out of the eighteen competitors, seven used brine as the last washing, and it is noteworthy that the first, second, and one of the third prizewinners were amongst these. The beneficial effect of brine thus used is to retain the flavor, increase the natural color, weight, and keeping qualities of the butter, and harden the grain or texture.

Quality and Quantity of Salt Added.—Hickson's and Higgins' were the brands chiefly used. The influence of the salt threw no light upon the cause of the fishiness in the butter. The quantities of salt added varied from 2¾ to 4¼ per cent. In the 168lbs. of butter, the first six successful factories in rotation added 4lbs. 9ozs., 6¼lbs., 6lbs., 6¼lbs., 4¼lbs., and 5¾lbs. of salt.

Preservatives.—The quantity of preservatives used did not exceed 12ozs. to the three boxes of butter. The first prize butter had 10ozs., the second 12ozs., and one of the third had ½ per cent. of "preservaline"; the other—one of the third prize butters—did not add a preservative beyond common salt. Eight ounces of "preservitas" to the 100lbs. of butter—the quantity recommended—was beneficial to the keeping qualities.

Weights of Boxes of Butter Before and After Refrigeration.—The average weight of butter and boxes immediately before refrigeration was 66¾lbs. The heaviest butters, when removed from the boxes, weighed at the end of the six weeks' refrigeration, 58lbs., 57¾lbs., 58¼lbs., and 58lbs. respectively. The weights of the same boxes before chilling were 67½lbs., 69lbs., 69½lbs., and 66½lbs. After chilling, and at the time of testing, they averaged ½lb. heavier. Four out of the eighteen lots weighed 65½lbs. at the commencement of the test, and the butters at the close of the examination were 57¼lbs., 57lbs., 57lbs., and 57lbs. Two boxes, belonging to separate lots, scaled 65lbs., and both the butters came out with 57lbs. exactly.

GADFLY AND BOTFLY.

By C. J. Valentine, Chief Inspector of Stock and Brands.

I notice that Mr. J. G. O. Tepper has had forwarded what he considers to be the true gadfly. Gadflies are found in many parts of Australia, and are more numerous in autumn, but some species are found as early as November, and no doubt the one referred to is one of the early species. These, however, must not be confounded with the botfly (Gastrophilus equi), which is a much worse pest, and more troublesome to the horse. Although well known in New Zealand, and has also been found in different parts of Australia, no cases have ever been reported in South Australia to any of the inspectors. That it may be introduced with horses is quite possible, even from Europe, but as the importations of horses are few in number we may hope to remain free for some time longer—at any rate no regulations will prevent the introduction. No correct information is available as to its first introduction into Australia. Mr. Richard Helms, biologist, writing on the subject, gives some interesting information on the botfly, known to scientists as Gastrophilus equi. He says gadflies are quite distinct from the botflies. Scientifically they are known as Tabanidœ, and belong to a structurally much higher developed family than the Orestridœ. Owing to the remarkable habit of living of the botfly when in its larval stage for eight months in the stomach of the horse, its introduction is easily accounted for and can scarcely be avoided. It is a matter of surprise it did not make its appearance before. The larvæ contained in the stomachs of the early introduced horses were probably voided during the voyage and thrown overboard with the manure.

In the life history of every species of botflies occur remarkable phases. All are parasitic during the larval stage, and pass that part of their existence, according to the species, in different parts of the body of their respective hosts.

The mature insect appears during the early part of the summer. After being fecundated the females seek a horse in order to deposit their small, white, cylindro-conical eggs upon it. They proceed by gluing the eggs upon the hairs of their future host, selecting those on the chest, shoulders, between the legs, and near the knees for this purpose, in fact, places easy reachable by the horse with its tongue; also in the long hairs of the lower jaw. After a time, differing probably according to temperature, from seventeen to twenty-two days, small white maggots emerge from the egg shells, a lid being cast off at the upper end before they escape. Their wriggling causes an itching sensation, inducing the horse to lick the place. In this manner the larvæ are conveyed to the stomach. Those produced from eggs adhering to the long hairs of the jaw drop among the food; together with the food they pass into the stomach, and there, by means of two hooks curved sideways and articulated at each side of the mouth, they fasten themselves firmly to the mucous membrane. In this position they remain whilst staying in the stomach, or sometimes in the intestines, and feed upon the blood and the gastric secretion of the host for upwards of eight months. They grow steadily, and ultimately attain the length of ¾ of an inch and half that width. In the meantime they have moulted several times (probably five or six). but the number has not been accurately ascertained. When full grown the shape of the bot is conical, pointed near the head and truncate at the anal end, and dirty pinkish or yellowish-pink color. The thick impervious skin surrounding the animal protects it in a most remarkable manner.

Towards the following summer the larva releases its hold and passes through the intestinal canal with the excreta into the open air. Under the droppings it bores into the ground For this operation its oval hooks or chelœ, as well as the fringe of tough points encircling the segments, are admirably adapted. For the purpose of burrowing the organisation of the bots is a marvel, as probably none could be found in nature better adapted for it. After penetrating a few inches the larva rests and soon proceeds to transform into a pupa. The final moult preceding this stage reveals but little change; it has become compressed and is dark in color, and has lost its motive power and is practically dormant. In this state it remains for six weeks; towards the end of the seventh week, after the larva having left its host, a two-winged fly—with six legs, compound eyes, oscelli, antennæ, and breathing orifices at the side—makes its appearance out of the ground. This completes the cycle of the life history of Gastrophilus equi, to begin again from the egg as soon as the female has been fecundated.

The fly easily escapes the notice of ordinary observers, except when it settles upon a grey horse, owing to its color. The head of the perfect insect is large and obtuse, the eyes blackish, the face covered with a light yellowish pubescence, the antennæ are short and dirty brownish, the thorax darkish grey, and the abdomen is a dull yellowish red brown. The wings are semi-transparent, with a golden tinge, marked with dark-brown spots, forming a sinuous band across their widest part, and darker spots near the tip. The legs are yellowish. The perfect fly can neither sting nor bite, nor has it a short ovipositor similar to that of the Hypoderma bovis, the botfly of cattle, which is a much more formidable insect.

To try and remove the bots by medicinal treatment after they are fixed to the stomach is labor in vain. They resist stronger poisons than would be safe to give to a horse. The only time promising an effective removal of the larvæ is when young and covered with a less impervious vestment than is the case after several months. A powerful drench administered soon after the horse has been infested may prove of great service. Preventive measures are best. Grooming and otherwise well looking after the horse will prevent the larvæ being taken in. The long hairs could be cut off, washing the parts most frequented occasionally; and horses running in paddocks could be rubbed over, with carbolic oil now and again, or even fat might be rubbed on the legs and other parts during the season when the botfly deposits its eggs.

HOW OUR WOOL IS DAMAGED IN VALUE.

Mr. Frank Johnson, son of Mr. J. A'ngas Johnson, through the agency of the chairman of the Bradford Dyers' Association, had excellent opportunities for hearing complaints and suggestions with regard to the get-up and marketing of Australian wool. Without exception, in every case the leading complaint was that there is so much twine and pieces of bale in the scoured wool from Australia, and this seriously detracts from the market value. The vegetable fibre of hemp, jute, &c., will not take the dyes that are used for wool, and the consequence is that the cloth shows every particle of vegetable fibre in it. Bits of string and woolpacks or bags get scattered on the floors of woolsheds, and are swept up with the locks or other wool, and it is next to impossible to pick it all out, because wool and hemp are nearly alike in color. When the woolpack is put into the press the threads on the four corners are cut for about 9in., and the pieces of twine and fibres of the bale get somehow mixed with the fleeces. In some of the scouring works the rollers are packed with bagging or twine instead of wool, which is always used in England. To provide against the serious risk of loss from the presence of vegetable fibres in Australian wool the buyers are obliged to allow themselves a considerable margin in the prices offered, so that the sheepfarmer suffers greatly from his carelessness. Grass seeds, burrs – especially the clover burr, are also very objectionable in wool, and their presence militates against the prices given. Wool is also damaged by branding, especially when tar is used. In Europe, generally, earmarking is adopted, and this is strongly recommended for Australia; but the earmarks should be registered.

A systematically got-up clip is to the seller's advantage, and a badly got-up clip is to the buyer's advantage. It is just as easy and as cheap to be systematic as to be careless in the woolsheds. Of course many woolsheds are well managed, and their clips are creditable. Buyers say that heavily-skirted wool saves them a deal of labor, and they pay a proportionate price for such. American buyers give heavier prices for heavily-skirted wool because the skirtings are not worked up in America. The reason why a bad clip sometimes brings more than a good one is that, according to the woolsale regulations, the buyer of the last lot put up has the option of the next one at the price of the room, consequently inferior lots are often purchased in order that the buyer can be more sure of securing the next lot. That is the reason why, at odd times, inferior lots bring more than their actual worth.

In regard to a suggestion that twine and bales should be dyed black—or some other color—so that pieces and strands could be readily picked out when mixed with wool, the cost would be ¾d. per pound for jute and 1¼d. per pound for hemp.

The shortage in Australian clips has favored those of Argentina and Cape Colony, which have improved considerably of late, and some of them work up nearly as well as Australian. Argentina wools have no burrs and are fairly soft.

All buyers prefer machine-shorn wool, as they find that shears make double cuts and more noil, and this makes a difference in the prices offered. Ever so small a portion of black wool in a bale will result in a fall of as much as 2d. per pound, because fibres of black wool can never be worked up with white to give any satisfaction.

Termites or white ants in wood can be killed by pouring Cooper's or Little's sheep dip (liquid) on the places attacked, especially if there are any holes into which it can sink.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

In the following table are given the results of analyses of various samples of bonedust obtained by myself during December. The list includes practically all the brands of locally-manufactured bonedust, the only makes not sampled being those of small dealers in country districts, who treat only a few tons annually: —

Analyses of Bonedusts.

Manufacturer.	Nitrogen.		Acid Soluble or Tricalcic Phosphate.		Price Charged per Ton.		
	Guarantee of Vendor.	Analysis byGovernment Analyst.	Guarantee of Vendor.	Analysis byGovernment Analyst.			
	Per cent.	Per cent.	Per cent.	Per cent.	£	s.	d.
L. Conrad, Adelaide	3·07	3·23	49·9	49·9	5	5	0
Crompton & Son, Adelaide (raw bonedust)	3·92	3·94	46·67	46·93	5	10	0
Adelaide Chemical Works, New Thebarton	4·14	4·14	43·4	46·27	5	5	0
F. W. Wittwer, Hahndorf (raw bonedust)	3·84	3·92	45·31	46·2	5	10	0
Baker & Co., New Thebarton (raw bonedust)	4·02	4·06	44·5	44·75	5	5	0
E. Anders & Sons, Freeling	3·7	3·71	40·43	44·31	5	5	0
L. Mehrtens & Co., Adelaide...........	4·01	4·01	38·70	39·94	5	5	0
Excelsior Manure Co., Cheltenham	2·57	2·71	35·	36·66	5	0	0
C. F. H. Stockmann, Kapunda (raw bonedust)	2·91	3.5	34·9	44·44	5	0	0

Considerable confusion has been caused in the past by one vendor showing the percentage of nitrogen guaranteed and another its equivalent as ammonia, making it impossible for the ordinary purchaser to make a comparison between the various fertilisers. To avoid this in the future vendors have been asked to show nitrogen as nitrogen, and not as its equivalent as ammonia, and I propose to show it in the published analyses as nitrogen. So with manures such as bonedust, mineral super., guano super., bone super., and mixed fertilisers, the terms water-soluble phosphate, citrate soluble phosphate, and acid soluble phosphate will be used to express the percentages of phosphoric acid in terms of tricalcic phosphate. I would again point out that when buying supers., but particularly mineral super., the purchaser should insist on the vendor guaranteeing the percentage of *water*-soluble phosphate before he signs any orders, and not to accept statement of contents, as for instance, "Superphosphate, 38 per cent. to 40 per cent. phosphates," as such manure may contain the greater part of its phosphates in citrate-soluble or acid-soluble form.

In regard to the guarantee I would also point out that if a fertiliser is guaranteed to contain 35 per cent. to 40 per cent. phosphate in any particular form, it is up to the guarantee if it contains only 35 per cent.; consequently purchasers must not expect to receive more than the *minimum* amount guaranteed, and in my published analyses I propose in every case to take the *minimum* figures as being the guarantee of the vendor. It will be noticed in the above table that every sample analysed shows better than the vendor's guarantee.

Taking the unit value of nitrogen in bonedust to be 13s., the average unit value of the acid-soluble phosphate is as nearly as possible at present market prices 1s. 4d. per unit. In order to compare the various brands of bonedust to ascertain which is relatively the cheapest, the percentage of nitrogen, *guaranteed*, should be multiplied by 13s., and of acid-soluble phosphate by 1s. 4d.; thus, taking the first on the list as an example:—

	£	s.	d.
Nitrogen, 3·07 per cent.—3·07 × 13s.	1	19	11
Acid-soluble phosphate, 49·9 per cent.—49·9 × 1s. 4d...	3	6	6
Comparative value of manure	£5	6	5

It is hoped that every shipment of fertiliser coming to this colony during the ensuing season will be sampled in bulk at port on arrival, while the local manufactories will be visited several times during the next three or four months. Analyses of samples of fertilisers will be published from time to time, and if information is desired concerning any fertiliser communications should be addressed to "The Inspector of Fertilisers, Agricultural Bureau Office, Adelaide."

PRODUCE EXPORT DEPARTMENT.

By the Manager.

The Department's work for the past four months has consisted of the treatment of lambs and butter and the shipment of wine.

Lambs.—This business has made a very marked progress, and the figures show a doubling of the exportation of the previous season. To date, 83,425 carcasses have been received, against 35,124 carcasses for 1898-9. The shortage of freight in steamers has again caused considerable inconvenience, and the depôt has now stored upwards of 40,000 carcasses awaiting shipment, steamers, through various causes, having been unable to fulfill engagements.

Butter.—The favorable prices ruling in the London market have been a stimulus to the export trade, making this a record season since the butter bonus years. The Department has shipped to December 28, 381 tons 10½cwts., against 130 tons for the previous season.

Wine.—For the six months ending December 31, 1899, the Department will have shipped for sale through the London depôt, 42,028galls.

The Imperial Government has placed an order with the Agent-General for South Australia for £2,000 worth of preserved meat for the African troops, and the goods are to be shipped under the supervision of this Department.

THE GOOD OLD DAYS AND NOW.

The following shrewd, though very humorous, remarks were made by Mr. Peter Allen at a conference of Northern Yorke's Peninsula Branches of the Agricultural Bureau, held at Port Broughton in April, 1899:—

The cultivation of the soil is the most ancient, the most honorable, and the most indispensable occupation of man. The first man of whom we have any record was engaged in this work, and from then right down through the ages there have always been tillers of the soil, and they have ever been, as now, the mainstay of the nations, and must continue so till the crack of doom, for only by the produce of the earth, procured by its cultivation, can life be sustained on this terrestrial ball. But old and tried as the occupation is, it is but yet very imperfectly understood, except of course by those who have never tried it! The method and means of cultivation were simple and hard from the very beginning, and age after age the farmers seem to have worried along in the same old groove, apparently satisfied that the system or want of system followed by their fore or five fathers was good enough for them. It is only within the past few years that scientific men have turned their attention to farming, and have thereby largely assisted in bringing it to its present state of imperfection.

Probably more progress and improvement has been made in the method and means of cultivation during the past fifty years than in all the preceding centuries. Experimental farms are now maintained by the State as object lessons, where professors who have made a life study of agriculture are employed to teach men to farm aright, while Agricultural Bureaus, composed of level-headed practical men, are disseminating knowledge and information broadcast throughout the length and breadth of the land, and manufacturers by inventive genius and skill are doing all in their power to reduce the cost of labor, simplify the working, and thereby increase the profits of the farm. The present-day farmer has knowledge and appliances at his disposal never even dreamt of in the philosophy of his father. And yet how often do we hear men—particularly the pioneers—harking regretfully back to the "good old days of yore"—the infant days of the colony. What glorious times they then enjoyed—how sweet the memory still! In fact, we have actually heard envious reference made to Adam, who is said to have been the first farmer, and as such enjoyed privileges and position never since equalled by mortal man. But what are the actual facts of the case? We have lately been hunting up the records, and find that this Adams—or, as he in our day would be called, Mr. Adams—began life as a gardener, but by some mismanagement, the blame of which he tried to put off on his wife, lost his situation, and, not having been brought up to any trade or profession, was unable to obtain other employment, and probably having a little means of his own he decided to invest it in farming, as many a man has since done to his sorrow. We have no details as to his method of working. He does not appear to have kept a diary, a rain gauge, or a bike, belonged to no agricultural or show society, wrote no letters to the papers, and does not seem to have been a member of any Bureau; consequently we are unable to say whether he was more successful with his farm than he had been with the garden. True, he had unlimited scope of country on which to work, and could extend his holding without let or hindrance. He was not hampered by complicated land laws, was free from land tax and water rates, never had his books or banking account overhauled by suspicious income tax collectors, was not compelled by the district council to contribute towards the construction and maintenance of roads, had no exorbitant railway charges to pay, but could dictate his own price and terms for wheat, and was in fact at one time in a position to corner the markets of the world.

But with all this, we do not learn that he made enough to retire on, for he had not the assistance of improved machinery. The stump-jumping plough was unknown in his day, likewise the stripper and twinebinder. He does not appear to have used seed drills or fertilisers, put his crop in as best he could, took it off in the same way, and instead of using Bagshaw's winnower and bagger probably had to do his wheat-cleaning with his hat and the wind. No; every advantage has its disadvantage, and as to the good old days of the colony, so often referred to, in what respect were they so much better than now? True, magnificent crops were grown, but what did it all amount to? A few acres only, cultivated with considerable labor, pain, and sorrow. The implements then in use were crude and ancient in design, and largely assisted in making wheat-growing a slow, laborious, and distasteful undertaking. In these happy wayback days horses were few and far between. The chief motive power on or off the farm was bullock power. If a man was out on business he would probably take the whole team with him; if on pleasure, two yoke of oxen and the dray; but if in a hurry, then he would walk. The old swing plough of one furrow was then the speediest known method of breaking up land; consequently the area under crop was never very great, which was probably a fortunate thing, as the method of harvesting was even worse than the putting in. The reap hook and scythe, worked of course by manpower, were the principal factors in taking off the crop. After the cutting—which included fingers, legs, &c.—the wheat was tied in sheaves, set in stooks, or carted into stacks to await the thrashing operation; and this same thrashing was no vain undertaking. The sheaves were strewed around in a circle, and a long string of bullocks yoked and chained was run round and round over it to knock it about with their feet. This they generally succeeded so well in doing that by the time they were hauled off they had scattered the wheat over nearly twice as much ground as it was grown on. If the thrashing was not performed by bullock power it had to be done with a villainous-looking contrivance called a flail. This weapon consisted of two 5ft. sticks fixed endways together by a piece of green hide, rope, or wire. The operator held on to one stick and swung the other wildly around his head in a manner calculated to endanger his own life or that of anyone within a chain of him. At intervals the revolving stick would be brought down with a sounding whack on an unoffending sheaf or anything else within reach. Sometimes when the machinery was in full swing the coupling strap would break and the farthermost stick would soar off with a velocity that meant death or destruction to anything that obstructed its onward flight. If the thrashing were being done in a barn the escaping missile usually went out through the roof, but if in the open air then the Lord only knew where it went. Another method of thrashing was to lay down a log and batter the sheaves on that till the grain was all knocked out of the ears and almost out of sight.

After messing and battering the grain about with cattle and sticks till it was pretty well the color of the earth from whence it came, what could be found of it would be scraped into heaps and then it was no easy thing to separate stones, earth, and chaff from the wheat. Winnowing machines were few and far apart, slow to work, plenteous in noise, and of a description that would not now be allowed or tolerated in the harvest field. When the cleaning had been accomplished it was not always an easy matter to get the wheat to market. The roads were long and not as good as they might have been, and railways were scarcely thought of.

The prices then obtained were not more satisfactory than now, for, there being no cable communication with lands across the sea, the farmer did not always feel satisfied that he was getting the full value for his wheat. If offered 15s. a bushel he thought he ought to have 20s., and so he really ought, for it was well worth that amount to grow it as he had to do.

In those oft-regretted days the weather was supposed to have been under Divine control, and not regulated by barometers and meteorologists; the seasons are said to have been less variable than now. More rain and wetter, sunshine more shiny, louder thunder, forkeder lightning. warmer frosts, bluer moonlight, bigger stars, higher whirlwinds, more Sundays, and no red rust, takeall, alien hawkers, insurance agents, or tax collectors. Yes; these were the good old days that we so often hear about! But as settlement increased district councils were formed, roads made, bridges built, and railways extended throughout the length and breadth of the land. Travelling was made easy, postal arrangements greatly improved, and modern appliances everywhere brought into use. Horses took the place of bullocks, the old wooden plough and harrow made way for lighter, speedier, and more effective implements. The scythe and reap hook disappeared before the mower and stripper. Labor-saving machinery was introduced wherever practicable, and so men's knowledge and opportunities increased; so also did their requirements. Larger areas were brought under cultivation, and larger returns secured, but never large enough to satisfy expectations or requirements. What satisfied men a few years ago would be considered positive hardship now. But 'twas ever thus: the more we have the more we want, and the more we know the more dissatisfied we become. Who now would really like to go back to those old works and ways, especially on a farm? What sort of a figure would the old-time farmer cut in these days of keen competition, low prices, and bad seasons? The cost of labor alone would be more than he could produce. In the sweet gone-by it would have taken about sixteen men and boys, forty-eight bullocks, and eight ploughs to turn over as much land in a day as can now be done by one stout lad with six horses and a six-furrow plough. The same lad with three horses and a stripper will take off as much crop in a day as could be done by about forty stalwart reaphook men; while three men with the latest improved winnower would clean as much wheat in one day as six old-timers with two of their hurdy-gurdies could do in a week. Then look at the convenience and facilities for getting produce to market. Instead of being a week or more on the road—and a bad road at that—now in most cases a day's journey will land the farmer and his wheat at the railway, where he may speedily be relieved of all further responsibility concerning it.

Even in selling wheat we have post and telegraphic advantages unknown to the ancients. In the olden times there would often be a difference of two or three pence per bushel in the prices offered by the different wheatbuyers. The farmer had, therefore, when selling to hawk a sample around to the various buyers to see who would give the highest price for it. In this enlightened day the buyers are on better terms with each other, and thoroughly understand the position and requirements of the farmers. It is not, therefore, necessary to take a sample around. We can take it straight to the nearest buyer, and rest assured that the price he offers is the highest we will get, for he knows exactly what the others will give, and should a man be rash enough to doubt his word, and take his wheat to the next town or station, he will find the price the same, or perhaps less, and that the buyer knows he offered it to the other fellow first. All this may be done by a simple little wire. Then about the bags. The old system was to have the weight of the bags deducted from the wheat, but now the buyer takes bags and all, and pays for gross weight, so that at 5s. a bushel for wheat the farmer would get 3d. for the bag, and if it cost him 4½d. he would only lose 1½d (at 2s. 6d. a bushel, 3d.), which is not much on one bag; but if, on the other hand, he got the bag for 2d. then he would net 1d. clear profit on the higher price, which is worth thinking about. But it is almost impossible to enumerate all the advantages possessed by the present-day farmer, as compared with the bygoners. In addition to improved machinery, oil engines, windmills, buggies, and bikes, he has the assistance and advice of scientific men, agricultural bureaus, insurance societies, mortgage companies, State banks, courts of insolvency, hospitals, and destitute asylums! He is allowed to contribute in various ways to the general revenue, and is every year becoming a greater shareholder in the national debt! He has also a voice in State affairs, and may occasionally become a candidate for parliamentary honors.

Yes, the farmer is now a recognised institution in the land, and so deep an interest does the State take in his welfare that by special request he is asked each year to furnish on a large blue paper, prepared for that especial purpose, a full and minute account of all his doings, his income and expenditure, his profit or loss—no detail is too small to interest the Government, whose watchful eye is ever on him.

The comparison between past and present is great indeed. The old order of things has passed away, and farming to-day all the world over is being conducted on more systematic and scientific lines than has ever before obtained. These are real live, go-ahead days, in which there is no time for vain regrets or looking backward. The man who now puts his hand—or himself—on the plough, must not look back unless to see if there is a stump under the share! In these days of keen competition we must keep abreast of the times or go to the wall, The method of cultivation in vogue in the colony in general, and these districts in particular, was none too good when the land was new and clean, but to continue it now simply means courting failure. Circumstances compel us to adopt safer and more economic lines, putting less land under crop, doing it better, and thereby getting larger returns. By a proper system of resting and working the land can always be kept in good heart; and, seasons permitting, fair returns secured. Seed drills and artificial manures have come to stay, and will play a prominent part in future farming operations, and will in fact revolutionise farming; but the cost and construction of both must be greatly reduced to bring them profitably within the reach of all. But this is only a question of time, and at no very distant date we shall be using seed drills and fertilisers manufactured on the Peninsula. We know that increasing the production does not improve the price, but we have no choice in the matter. The price is regulated by the markets of the world, and we have therefore to compete against the world, the flesh, and the devil. Our business is, then, to make the best possible use of our opportunities; increase and maintain the productiveness of our land; spend no time in vain regrets for what we did not get out of the past, but get all we can out of the present; endeavor in every legitimate way to better our position, and make farm life as pleasant and profitable as it ought to be; pay tribute where compelled to; be neighborly and obliging towards each other; helpful to those in need; slow to anger, especially with wheatbuyers; respectful to all men, but taking sauce from none.

JERSEY BUTTER YIELDS.—In a competition conducted under the auspices of the English Jersey Cattle Society forty-four cows were entered. The winner had been in milk 101 days, and yielded 40lbs. 10ozs of milk on the day of competition, from which 2lbs. 6¾ozs. of butter were made. Another cow in milk the same length of time gave only 29lbs. 6ozs of milk, which, however, yielded 2lbs. 3½ozs. of butter. The average of the forty-four cows was 31lbs. 7¾ozs. of milk for the day, the average yield of butter being 1lb. 11ozs. One cow 193 days in milk yielded 1lb. 15½ozs. of butter. On the whole the yields were somewhat lower than last year's average, but this is accounted for by the fact that the cows entered averaged a considerably longer period in milk.

RESULTS OF IMPROVED FARMING.—The following comparison of the yields of various cereal crops at the Central Experimental Farm, Ottawa, Canada, is a striking testimony to the results of farming on scientific principles. The years 1889–90–91, the first three after the farm was fairly established, show the following results compared with averages for 1896–7–8 :—

	1889-90-91. Yield per Acre. bush. lbs.	1896-7-8. Yield per Acre. bush. lbs.
Oats, average crop for three years..............	32·17	56·6
Barley " " "	31·6	43·13
Wheat " " "	15·19	20 9

These additions to the yields have been gained by the moderate use of fertilisers, the ploughing under of green crops, the more thorough working of the land, early sowing, and selection of more productive varieties for seed.

THE CARNAHUBA PALM (Copernicia cerifera) grows as far south as Sydney. It resists drought in a remarkable degree, and prospers even on a somewhat saline soil. Its roots have the same medicinal effect as sarsaparilla; the stem furnishes sago or starch, also strong light fibres, very lustrous; the leaf stems give fibre for ropes; the stem is also used for joists, &c. The leaves are used for mats, baskets, thatch, hats, brooms, &c., and resist decay in water, the same with the fibres. The inner part of the leaf-stalks can be used in place of cork. From the sap is procured sugar, milk, vinegar, salt, alkali for soap, and wine. Its fruit is used for feeding cattle, and as a substitute for coffee. The pulp is sweet and agreeable. This palm is chiefly valued for the carnahuba wax, with which its young leaves are coated, and which is collected by shaking it off on to sheets. This is harder than bees' wax, and is used mostly by candle-makers. Each tree furnishes about 4lbs. annually. In 1862 2,500,000lbs. were imported annually into England, realising about £100,000. This palm is a native of Brazil, Bolivia, Argentina, and many of the South American States. It would probably thrive in our North country.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, DECEMBER 20, 1899.

Present—Messrs. F. Krichauff (Chairman), W. C. Grasby, T. B. Robson, W. F. Snow, Hon. A. W. Sandford, M.L.C., and Secretary (Mr. A. Molineux).

Finances.

The SECRETARY stated that he had received a minute from the Minister of Agriculture instructing him that the amount placed on the Estimates for the Bureau work must not be exceeded. After some discussion it was decided to again call the attention of the Minister to the fact that the work of the Bureau was being seriously affected by the continued reductions in the vote for expenses.

Modiola decumbens.

The CHAIRMAN tabled a small packet of seed of this fodder plant which he had received from Mr. T. E. Rice, of Livermore. California. It was reputed to do well on alkaline soils, and to be better liked by stock than most of the Australian saltbushes, owing to its stems being less hard and woody. It was decided to send seeds to suitable localities for trial. He has also received a small packet of seed of Sorbus aucuparia from Mr. H. Ohrt, of Oldenburg.

Wheat Sample.

Brinkworth Branch forwarded average sample of the season's wheat grown in that district.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

330. *Lime.*—American farmers say, "A limestone country is a rich country." By its means the plant foods, which can be used in a direct way by plants, and which have their origin in organic substances, are largely added to through the chemical alterations in the soil. Organic substances fall to pieces, and nitre is formed. Soils that contain but little lime do not give to the humus the black color. The substances formed have a brown color, and are named "Ulmin," while the black are "Humin." Lime destroys the noxious substances which hinder the growth of plants mainly acids. Sulphate of ammonia, sulphate of potash, and muriate of potash are not as such plant food; they must first be altered in the soil, in which the lime combines with the acids. Of as much importance is also the physical action in more or less clayey land. The soil is easier worked, and crumbles so as to enable a better access of the air and water, and the temperature of the soil does not fluctuate so much. It neither gets so hot nor so cold. Marl cannot show the same physical effect as burnt lime, but it also acts well as regards the acids in the soil. From 4,000lbs. to 12,000lbs. per acre of lime is used on very stiff clayey land; light lands may require 8cwts. to 16cwts. per acre, and strong soils up to 32cwts.

331. *Forests of the World.*—C. F. Reichelt, of Berlin, gives the following data:—Russia in Europe possessess 2,130,105 square kilometres, or 42 per cent. of its area; Sweden, 171,169 square kilometres, or the same percentage; Austria, 199,298 square kilometres = 31 per cent.; Germany, 138,774 square kilometres = 26 per cent.; Norway, 76,437 square kilometres = 25 per cent.; India, 565,600 square kilometres = 25 per cent.; France, 83,830 square kilometres = 16 per cent.; Portugal, 6,730 = 5 per cent.; Great Britain and Ireland, 11,272 square kilometres, 4 per cent.; Cape Colony, 1,593 square kilometres, 0·29 per cent.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Koolunga, Mr. John Pengilly; Gumeracha, Mr. J. C. Gall.

Reports by Branches.

The SECRETARY reported receipt since previous meeting of forty-six reports of Branch meetings.

REPORTS BY BRANCHES.

Swan Reach, November 8.

Present—Messrs J. O. J. Kohnke (Chairman), P. A. Hasse, J. L. Baker, B. Schwarz, P. A. Beck, L. Fidge, R. J. Harris, W. White, J. H. Hemig, D. Rowe, F. Fischer, O. Halliger (Hon. Sec.), and C. Drogemuller (Bowhill Branch).

Algerian Oats.—Mr. J. L. Baker reported that he had harvested thirty-two bags of Algerian oats from one bag of seed.

Rabbits.—Chairman said he had found phosphorised pollard the surest and cheapest poison for rabbits.

Best Wheat for District.—Opinions as to which is the best variety of wheat to grow in this district were divided, but the majority favored Purple Straw, with a change of seed from another district.

Mount Bryan East, November 18.

Present—Messrs. T. Wilks (Chairman), J. Prior, T. Best, W. Bryce, E. T. Prior, W. H. Quinn, and W. Dare (Hon. Sec.).

Locusts.—Members were greatly concerned at the damage done by the locusts; it was considered that at least one-third of the crops had been eaten and destroyed. They ate off the flag first, then commenced on the heads of wheat. Some very promising crops were rendered almost useless either for hay or wheat. Flower gardens and vegetable crops were also laid waste.

Stansbury, December 2.

Present—Messrs. Alex. Anderson (Chairman), J. Henderson, H. C. Pitt, C. Faulkner, G. Jones, and P. Anderson.

Crops.—Cereal crops were reported to be turning out a good sample. Vines are luxuriant since the November rains, and the grapes are setting well. The ground has not had a good soaking during the season, and, considering that fact, things look well.

Lime as a Preservative of Wood.—Mr. P. Anderson read a clipping from an American paper, which stated that lime is a preservative of wood of any kind that has to be buried in the soil.

Gumeracha, November 14.

Present—Messrs. W. A. Lee (Chairman), A. E. Lee, W. V. Bond, W. J. Hannaford, D. Jamieson, W. Cornish, D. Hanna, J. Monfries, A. Moore, Dr. Gray Nicholls (Hon. Sec.), and one visitor.

Potato-growing.—Mr. A. E. Lee read the following:—

There are few crops grown on the farm that will give a better average return for labor expended than potatoes. The land should be that best adapted for the purpose—deep loamy hillsides and black soil flats and gullies.

The preparation of the land should be commenced in the autumn, when all manure left over from previous year should be carted and spread on the land, and ploughed under after the first rains. If the land is of a stiff or clayey nature it will be greatly improved by a heavy application of scrapings from cattle camps, stock, and stackyards, &c. If lime can be procured cheaply it will answer the purpose best, especially if the land is sour.

If the land is left fallow until the spring it should be worked occasionally with harrow or cultivator, especially if weedy. Another plan, and I think a better, is to sow a crop of peas (about 3bush. per acre) with 2cwts. bonedust. This crop, if sown early, will produce a large quantity of vegetable matter which, if turned under with the plough at planting time, will act in a beneficial manner on the soil by assisting it to retain moisture. This crop will also add a considerable amount of cheap nitrogen to the soil.

The best fertiliser that can be used for potatoes is well-saved stockyard manure, which, if well rotted and the land moist, can be ploughed in when planting. If the land is dry the manure should be spread and turned under earlier in the season. Twenty tons to 30 tons per acre can be used to advantage. But there are few farmers who have sufficient for more than a small area ; it therefore becomes necessary to resort to commercial fertilisers. The quantity per acre giving best results, the best methods of applying, and the results of various experiments, &c , are given in the *Journal of Agriculture and Industry* for August, 1899. A perusal of the article by those interested in the subject will well repay the trouble.

In planting large quantities of potatoes the quickest and cheapest method is after the plough ; and if the land is in good order, and the setts pushed into the side of the furrow, the horse will disturb but few. The rows should be about 24in. apart. This will leave ample room between the rows to work the land with the cultivator. The setts should be from 9in. to 12in. apart. A great difference of opinion exists as to the size of the seed. Some growers prefer them large, while others believe that small seed is best. Good crops have been obtained from both large and small seed, but probably a medium-sized seed, say about 1in. to 1½in. in diameter, will give the best results. If possible, the seed should be planted when the shoots are just appearing, as the first sprouts are the strongest. It is advisable to change the seed every year. This can be done by exchanging with growers on the plains or, better still, procure our seed from outside the colony.

The best kind of potato to grow will depend to some extent on the locality, the soil, and the time of planting. No potato appears to give better results as an all-round crop in this district than Beauty of Hebron ; Elephant, Regent, and several other kinds are also spoken well of. After planting, the land should be harrowed and rolled, and, if weeds appear, working with a light harrow on dry days is recommended, and can be continued until the plants appear above ground, after which the cultivator can be used between the rows. The cultivation should be shallow, not more than 2in. or 3in. in depth, and not too close to the plants, as this may injure the roots and so check growth. When well grown the potatoes may be earthed up; this prevents sun-scorching.

The most destructive diseases to which the potato is liable are known as the early blight and the late blight, both diseases being of a fungoid nature. The early blight has made its appearance in this district, and although it has done little harm as yet, it may become serious in the future, and it is well to be able to recognise it and to know the remedy.

The parts of the plant affected are the leaves, which turn brown at the edges and curl up. When the plant is badly affected the growth of the tubers is checked, and they do not come to maturity. The late blight is fortunately unknown in Australia. Professor Slingerland, of America, in describing this disease, says :—"It appears on the leaf as a purplish-black spot, which rapidly increases in size until the whole leaf is covered. After a time the fungus appears on the under side of the leaf as a delicate white mildew. The germs, falling on the ground, are washed into the soil, attacking the tubers and causing the potatoes to rot." Both the early blight and the late blight can be prevented by spraying the potato vines with the well-known fungicide, Bordeaux mixture. The plants should be sprayed immediately on the appearance of the blight, and, if necessary, this spraying should be continued at intervals as long as any danger exists. It is impossible to say how many times the spraying should be repeated, as much will depend on weather conditions.

The insect pests attacking the potato are red spiders and caterpillars.

Bordeaux Mixture.—What is known as the 4, 4, 40 formula is in most general use. The method of preparation is as follows :—Weigh out 4lbs. copper sulphate, and suspend in a bag, in a barrel containing 20galls. water. Put 4lbs. fresh unslaked lime in a pail, make a smooth paste of it by gradually adding water. When the lime is cool, and the copper sulphate dissolved, stir the mixtures, and pour them into a barrel large enough to hold 40galls., fill up with water, stir well after mixing, and strain through cheese cloth before running through the spraying pump. If Paris green is used, first make into a paste, then stir into the barrel of spraying mixture. Paris green will destroy any gnawing insects which attack the leaves. Flowers of sulphur will destroy red spider if sprinkled on the plants when the sun heat is powerful enough to make the sulphur fume.

Mr. Cornish would not cultivate too deeply whilst the plants are growing. Mr. Jamieson was of opinion that large seed gives best results. Mr. Monfries would harrow the crop when growing if weedy. Mr. Moore would plant setts with a dibber, and thought working on the crop dangerous. He would like a change of seed every year, and would plant now, or even as late as January. Mr. Hanna advocated harrowing after planting. Mr. Lee recommended green manuring before planting, and would plant with aid of the Planet cultivator. Mr. Bond objected to banking up too much. Members wish to know why the frost cuts some potato plants whilst others close by are uninjured, and how it is that those which are not injured have smooth leaves.

Meadows, December 4.

Present—Messrs. T. B. Brooks (in chair), G. Rice, W. J. Stone, G. T. Grigg, W. A. Sunman (Hon. Sec.), and three visitors.

Business.—Members decided that it is desirable to arrange for an autumn show in connection with this Branch. Rest of the business was of a formal nature.

Bowhill, November 18.

Present—Messrs. A. Dohnt (Chairman), A. Groth, J. Waters, W. G. F. Plummer, A. Dohnt, jun., H. H. Plummer (Hon. Sec.), and four visitors.

Wheats.—Messrs. Towill and W. Plummer tabled Gravestock-Frampton and Steinwedel wheats in straw and fully ripe, to dissipate an idea that they are alike in appearance. Mr. Groth said Steinwedel is more compact in the head and thinner in the straw than Frampton, and he could see a great difference between the samples exhibited. The Chairman said Steinwedel shatters out, but Frampton does not It is stronger in the stem than Steinwedel, stands heavy winds better, and does not go down as the Steinwedel does, but the latter averages well. Mr. Prosser believed that the apparent difference between the so-called Gravestock-Frampton and Steinwedel was owing to the former having been grown on better soil and conditions than the Steinwedel; but he would admit that, if the heads were not specially selected, the sample called Frampton was better than the other.

Insects on Wheatfield.—Mr. Plummer called attention to the myriads of insects about half the size of a grain of wheat on patches of wheat land affected with "takeall." He was inclined to think they were the cause of "takeall." Another member thought takeall was caused by over-cultivation and not resting the land. Yet another did not think takeall was due to bad cultivation, and he had known these insects for thirty-five years; sometimes they had been so numerous that he could not cut his hay. Another said takeall patches had been treated with various manures without any beneficial effect. Mr. Plummer said members should take note of the varieties that withstand frost, and of those which give best yields.

Mount Compass, December 9.

Present—Messrs. M. Jacobs (Chairman), F. Slater, S. Arthur, W. Gowling, R. Peters, A. J. Hancock (Hon. Sec.), and three visitors.

Giant Bamboo.—New seeds of the Giant bamboo were received, and are to be sown experimentally to plant across the valley at intervals and serve as a windbreak. Should this be successful the bamboos will be of great value for scaffold poles, water pipes, and a hundred other purposes.

Success in Poisoning Caterpillars.—Mr. Jacobs reported that he had killed all the caterpillars infesting his potatoes, onions, and other vegetables by mixing 4ozs. Paris green, 30lbs. bran, and 4lbs. coarse sugar with sufficient water to make a thick paste, and scattering the same in very small pieces amongst the crops.

SEASONABLE HINTS.—Plant and sow cabbages, cauliflowers, potatoes, turnips, swedes, parsnips, celery, peas, beans (broad and running), and salads.

NOXIOUS WEEDS.—Members reported small red field poppy and a plant called "blind nettle" as making their appearance in the district.

QUESTION.—After being headed down does the remaining stock of an apple tree grow upward or taller? [No.—GEN. SEC.]

Wilmington, December 11.

Present- Messrs. J. Hutchens (Chairman), J. Schuppan, J. Zimmermann, J. McLeod, T. Carter, A. Paull, W. Slee, J. Hannagan, H. Noll, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

CONFERENCE.—Resolved to support the Congress of Upper Northern Branches at Quorn on February 16, 1900.

PESTS DESTROYED.—Mr. Slee reported having conquered insects attacking melon and tomato plants by sprinkling them with quicklime and dry soot.

BEST WHEATS FOR DISTRICT.—Mr. Schuppan tabled several varieties of wheat. He thought the best for this district are Bluey, Purple Straw, and Indian King. Mr. Zimmermann mentioned Premier as being very early and giving satisfactory results.

IDEA FOR LEADING HARNESS.—Mr. Zimmerman showed an idea of his own in ironwork for leading harness, which was greatly approved of by the members.

QUESTION BOX.—Decided to place a box in a conspicuous place where questions of a practical nature may be placed for consideration by members.

STOCK-BREEDING.—Mr. Hutchens read a paper, of which the following is the substance:—

The Horse.—There is still plenty of room left for improvement in the class of sires to be used for breeding farm horses. The stock from a good horse will sell for more than double the price of those from an inferior sire. Even if the mares are not of the best stamp, there will in time be improvement if good sires are used; but unless this is done there will never be improvement. Where both sire and dam are good there is very little difficulty. Breeding from blood entire and draught mare has been much practised, with but few good results. It is better to breed from a draught entire with a blood mare; then put the cross-bred mare to a blood entire, and the result will be a good saddle or light harness horse. For good farm or trolly horses put the cross-bred mare to a draught stallion. In using the draught horse with the blood mare see that the horse has not too large a head, but has a good neck, well quartered, stands at least 16 hands high on good flat-boned legs, with well-shaped hoofs.

The Cow.—Good results follow the use of the Jersey bull and Shorthorn cow, giving a really good dairy cow, which yields better returns for the quantity of food supplied than is recovered from the larger animals. The Jersey-Shorthorn cross put to the Ayrshire bull makes a very nice cow, and, if the stock is getting too small, use the Shorthorn bull. In every case the bull should be of the purest breed. In selecting a bull calf for the stud see that the four teats are large—the larger and the wider apart the better. Such a bull is almost sure to throw heifers with good udders and teats.

Pigs.—The white Yorkshire boar is a good one for crossing with pure Berkshire sows, or any other breed for that matter. The Yorkshire is a quiet pig and easily kept. It is much liked at Chicago, the largest pig market in the world. When killed the skin of the Yorkshire and its progeny is almost as white as snow, which looks nice for porkers, and the bacon is delicious.

In discussion members agreed that the Jersey-Shorthorn cross is to be recommended for milking cattle. They also agreed that pig breeding and rearing is profitable, but farmers' bacon cannot compete with that made at the factories. The white Yorkshire is considered to be an excellent bacon-maker. In regard to horses, some members agreed with Mr. Hutchens, but others would reverse the order of crossing.

Clare, December 8.

Present—Messrs. W. S. Birks (Chairman), J. Treleaven, G. S. Berriman, J. T. Hague, C. J. McCarthy, and H. J. Yelland (Hon. Sec.).

AGRICULTURAL SCHOOL.—In answer to a letter of inquiry from Naracoorte Branch, the members of Clare Branch express a favorable opinion of the practical work done by the class here.

SELECTION OF SEED.—Members are sure that by careful selection and culling of seed a better sample of grain and heavier yields would be secured. [By such a system, intelligently followed, not only cereals, but every class of fruit, vegetable, plant, and animal can be and has been greatly improved.—GEN. SEC.].

Johnsburg, November 11.

Present—Messrs. F. W. Hombsch (Chairman), G. H. Dunn, M. L. Read, H. Napper, T. A. Thomas, J. Thomas, L. Chambers, J. R. Masters, J. Sparks, W. McRitchie, T. Johnson (Hon. Sec.), and two visitors.

CONFERENCE.—Resolved to support the Conference of Upper North Branches at Quorn on February 16, 1900.

STANDARD BUSHEL.—The Chairman read a short paper on this subject, reiterating the arguments so often used by others as to the necessity for an annual standard of average quality of wheat; that if deduction is made for wheat under standard an equivalent should be paid for grain weighing over the standard. In discussing this subject members desire to keep it constantly under notice until a reform is effected. Farmers were strongly advised to clean their wheat well before marketing it. It was stated that the agents were at fault in "docking" for alleged light weights, and not the principals.

RABBITS.—Mr. Dunn showed model of an improved rabbit trap, which takes them alive. Messrs. Hombsch and Chalmers had tried poisoning rabbits in the burrows with much success on the plan recommended by Mr. Dunn at the previous meeting. [See *Journal* for November, 1899, page 416.—EDITOR.]

TRIAL WHEATS.—At the invitation of Mr. T. Thomas members inspected trial plots of Bartlett's Crossbred and Indian King wheat, presented through Central Bureau. Considering the very dry season both lots looked healthy, and the locusts had not injured them, although they were plentiful in adjacent grass paddocks.

Auburn, December 14.

Present—Messrs. E. M. Dudley (Chairman), W. R. Klau, J. Hean, G. R. Lambert, and Dr. J. W. Yeatman (Hon. Sec.).

SHEEP *versus* WHEAT.—Members discussed an article in the *Australasian* stating that, including rental value of land on average country, wheat cannot be cultivated for less than £1 per acre, not allowing for manures. An average of 10bush. at 2s. 3d. per bushel would realise £1 2s. 6d., but as the whole of the land could not be under crop every year, this would leave at least one-third out of profit. Taking the average yield of wool at 6lbs. per sheep, and that the land will carry one sheep per acre, with wool at 1s. per pound there should be an income of 6s. per acre, less 6d. per sheep for working expenses, and not considering profit from lambs. Members thought that the average weight of fleece in this district would be nearer 8lbs., and that the land, in good seasons, would safely carry over a sheep per acre, so that the profit on sheep would be higher here than as above stated. They thought that the profit on wheat, if anything, had been placed at too high an estimate. Indeed, growing wheat at

2s. 3d. per bushel was to work for less than bare wages, whilst the risk and anxiety were great. There is no possibility of obtaining an advance on a growing crop, as could be done with sheep, if the farmer found himself in a tight place. Most farmers would, of course, combine sheep with wheat-growing, but members thought that in view of present prices the larger the proportion of sheep kept the better would be the results, both in cash and in benefit to the land.

Pyap, December 13.

Present—Messrs. B. T. H. Cox (Chairman), J. Harrington, J. Bowes, E. Robinson, T. Smith, C. Billett, G. Napier, J. Arnold, H. Mills, J. F. Bankhead, W. C. Rogers (Hon. Sec.), and one visitor.

Standard Bushel and Bags in.—Resolved—That, in the opinion of this Branch, farmers should co-operate in order to cope with these and other difficulties applying to their business. [Farmers who are joining the Farmers' Co-operative Union can and do secure all these and many other advantages. —Gen. Sec.]

Nantawarra, December 12.

Present—Messrs E. J. Herbert (Chairman), R. Uppill, A. F. Herbert, and T. Dixon (Hon. Sec.).

Poultry Complaint.—The Chairman tabled legs of fowl under twelve months old which had been diseased for some time. The legs were covered with scales; he had rubbed them with turpentine and kerosine without effect. The fowls had had free run. [Mr. D. F. Laurie states this to be a bad case of elephantiasis (scaly leg). It is sometimes caused by a small mite, but is also due to a deficiency of oil in the scales. It may be cured, or at any rate relieved, by scrubbing with a stiff brush and hot soapy-water, which will remove most of the scales without much bleeding. The legs should afterwards be dressed with kerosine and oil, or strong sulphur ointment, to which a few drops of oil of tar may be added.—Gen. Sec.]

Watervale, December 11.

Present—Messrs. S. Solly (in chair), L. Buring, W. Field, H. Beck, H. Croft, and E. Treloar (Hon. Sec.).

Exhibits.—Mr. Solly tabled sample of King's Early wheat, which a short time ago gave promise of 18bush. per acre; but, owing to frosts and very hot weather, will now yield only 10bush. per acre. He considers it a splendid wheat for hay, as it matures early. Mr. Treloar tabled Mansfield Seedling apricots, early, but small.

Indian Runner Ducks.—Mr. Beck said he has some young Indian Runner ducks which commenced to lay at 17 weeks of age. The older ducks are wonderful for laying.

Depraved Appetite in Cows.—Mr. Treloar wishes to know why his milking cows are so partial to dry horsedung when they have an abundance of good food and clear water. [They want phosphates and rock or other salt. Give them a little finest Bally bonemeal in bran mashes twice or three times a week. Place a lump of rock salt where the cows can get ready access to it.—Gen. Sec.]

Guarantees with Fruit Trees.—Mr. Buring suggested that all persons purchasing trees from nurserymen and others should demand a guarantee that such trees are true to the name given, and that they are budded or grafted on the stocks named in the guarantee. Great disappointment and loss had been sustained by many people in the district through trees being worked on the wrong stocks, and often being untrue to the name given by the vendors.

WEEDS.—Several new weeds have been noticed in this locality, and other old weeds are gaining ground.

Gawler River, December 15.

Present—Messrs. J. S. McLean (in chair), J. Barrett, J. Hillier, T. P. Parker, C. Leak, J. Drinkwater, A. Bray, D. Humphries, and H. Roediger (Hon. Sec.).

DESTRUCTIVE BEETLES.—Some beetles were brought in at previous meeting. They had been destroying vegetables in various gardens, and were numerous. Letter received from the General Secretary stating that they are known as the native curculio (Desiantha maculata), and recommending trial of Paris green as a remedy.

EFFECTS OF FERTILISERS.—Mr. McLean applied Colonial Sugar Refining Co.'s super. to a hay crop, and got a much better crop than from bonedust. Mr. Parker used the same kind of manure, and got 2 tons of hay per acre, whilst the crop on adjacent land unmanured was worthless. He also stated that wheat drilled in without manure gave better results than wheat broadcasted without manure. The Hon. Secretary reported that the results from the manures supplied for experiment by Mr. Francis H. Snow had not been quite satisfactory, partly on account of the dry season, and partly because they were used on freshly ploughed ground.

BEST WHEAT FOR HAY.—Mr. McLean recommends Marshall's Solid Straw and Marshall's No. 3 to be good wheats for hay crops; other members favor Tuscan varieties and Red Straw also good for this purpose.

EXHIBITS.—Mr. Leak tabled Californian Purple wheat, a new bearded variety, which is considered by members to be a good variety. He also showed White Essex, Leak's Rust-proof, and Cape oats.

Millicent, December 7.

Present—Messrs. R. Campbell (Chairman), S. J. Stuckey, H. F. Holzgrefe, H. Hart, L. Oberlander, W. R. Foster, W. J. Whennen, H. Warland, B. Varcoe, G. Mutton, A. McRostie, H. A. Stewart, E. J. Harris (Hon. Sec.), and eleven visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of the Chairman (Mr. R. Campbell). After lunch a number of experimental plots of wheat, each one a chain square, were inspected. These had been treated with various fertilisers supplied by Mr. F. H. Snow, but, owing to the presence of a deal of sorrel on the ground, did not generally show good results. Plots treated with 40lbs. Thomas phosphate, 12lbs. nitrate of soda, and 12lbs. nitrate of potash showed fairly good results. Members did not consider that these fertilisers had a fair test, as several of the plots had much more sorrel than the others. A plot of Surprise oats promises a large return from ⅓oz. of seed. Crimson clover and vetches left for seed look well. Three acres of Yorkshire Hero peas and four acres of Redskin potatoes give promise of good yields. Nearly 500 trees, chiefly apples, apricots, plums, and peaches, were exceedingly healthy, and give great promise for the near future. Raspberries and strawberries also do well.

BUSINESS.—Mr. S. J. Stuckey complimented Mr. Campbell on the general result of his experiments. He advised him to work more for profit. Small experiments may look well, but it is only large quantities of marketable products that pay. Some other members spoke to same effect while eulogising his public spirit in conducting so many experiments. Mr. Campbell, in return, criticised some of the old methods followed by farmers; for instance, the practice of rearing and fattening a few pigs in a pen 8ft. x 10ft. He would as soon think of rearing sheep for their fleece and progeny in the same way. He had tried on the broader lines and found the business pay. Of course, it was possible to make a glut unless wider markets were opened. Mr. A Ve cht, of the Intermarine Supply Co., offered to erect works to cost £20,000 if he could be guaranteed a regular supply at not less than 3d. per pound, and as they raised pigs to pay in America at 2¼d. to 2½d. per pound he thought it could be done here, but not in 8ft. by 10ft. pens. The demand for cheese had increased with the supply, and so would it for bacon. Mr. Stuckey said at one time they had heard the cry that the export of butter would increase the cost to local consumers, but this had not occurred, and yet greater profits had been secured by dairymen. Delegates from England had said they could take large supplies of our produce, but we were not making as much out of it as could be desired. Mr. Holzgrefe had not found dairying profitable. He had done a good deal in it, but to cart milk five miles for 2½d. per gallon would not pay a fair wage if they had to hire labor. A good deal more discussion was indulged in, and it seemed to be concluded that cheese should be made when butter is at a low price, and butter manufactured when it is more profitable to do so.

Weeds —Letter from General Secretary identified a weed sent up as Swainsonia lessertifolia. Most of this tribe of plants are reputed to be poisonous at certain periods of their growth. Several kinds of thistles, including star thistles, are spreading in the district.

Exhibits.—Mr. Whennen tabled samples of Petatz Surprise and Brown Tuscan wheats. The former was badly rusted, and not so good as Brown Tuscan. Mr. Holzgrefe had grown Petatz alongside of Purple Straw, and the Purple Straw was the better of the two.

Trade Tricks.—Several members complained that some of the city firms are in the habit of purchasing produce by sample, and if the market falls before bulk can be delivered they reject it on the plea that it is not up to sample, but if the market rises no such objection of course is made. After a good deal of discussion it was suggested that producers should combine and sell their own produce in bulk from or through their own city agency.

Mount Gambier, December 9.

Present—Messrs. J. Umpherston (Chairman), J. C. Ruwoldt, D. Norman, sen., J. Bowd, T. H. Williams, W. Barrows, J. Watson, M. C. Wilson, T. Edwards, G. Bodey, and E. Lewis (Hon. Sec.).

The Farm Tour.—The Chairman, in referring to the report on visit to farms, said he was pleased with the Government Ayrshire bull, and strongly advised that the breeding must be followed up, and not have one cross and then drop it. The gardens and farms visited were select and special, and he hoped they would all benefit from what they had seen. He was glad to see that the Berkshire breed of pigs was favored in the country, as he believed they were the best that could be kept.

Manures and Takeall.—The Chairman said he had tried superphosphate for the last two years, but could see very little benefit from it. It was suggested that the land was already well supplied with phosphoric acid. The Chairman replied that he always got good results when he applied farmyard manure. [Which is chiefly nitrogenous.—Gen. Sec.] Several members had remarked that circular patches of crops and grasses in the district were dying out completely, and it was suggested that this is due to "takeall." Mr. Ruwoldt said he had patches of "snuffy" soil where all vegetation died out. Several members believed "takeall" is due to minute grubs, which work round in rings. The Chairman said he had salt placed around some of these rings, and that stopped the extension. One crop of potatoes on a hillside had completely died out, but on the flat the crop was all right. ["Takeall," which works in rings, has been traced to a parasitic fungus. Will some member try experiments with dilute sulphuric acid or bluestone solution.—GEN. SEC.]

WEEDS.—The field buttercup (Ranunculus acris) is spreading in some parts of the district, and is becoming a pest. "Wild radish" is also becoming a nuisance. Thistles of several kinds are abundant, but it is difficult to get magistrates to uphold the Act. Mr. Bowd said if anyone troubled with thistles would grow rape there would be no thistles next season.

Dawson, December 16.

Present—Messrs. R. Renton (Chairman), Jno. Collins, C. F. W. Just, A. H. Warner, A. F. Dempsey (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—It was decided to comply with request for sample of present season's wheat as sold in the market without any deduction.

DAMAGED CROPS.—Matters in connection with the fund being raised to help those farmers in the district of Coglin who lost their crops through the hailstorm were dealt with.

LOCUSTS.—Discussion took place on damage to crops and grass by locusts.

Kanmantoo, December 14.

Present—Messrs. Thos. Hair (Chairman), W. G Mills, F. Lehmann, J. P. Hair, P. Lewis, and A. D. Hair (Hon. Sec.).

KING'S EARLY WHEAT.—Several members reported on their trials with this wheat, but, as a whole, they were not favorable. Mr. Lehmann had sown Early Para and King's Early side by side under similar circumstances; the former was slightly inferior both as to yield and quality, there being also less white heads in King's Early. Other members stated that the wheat proved too weak in the straw, causing loss in harvesting, besides which it was more troublesome to clean, and did not yield any better than other varieties they were growing.

WEEDS.—Mr. Mills asked best means of getting rid of the weed known as "sticky weed" [What is "sticky weed"?—GEN. SEC.] He also stated that, though at one time his wheat was nearly choked by sheep weed, the plant suddenly died off, and he had not been troubled since by the weed in this particular paddock.

PRESERVATION OF FEED.—Mr Mills read a paper on "How to Conserve our Natural Grasses."

Cherry Gardens, December 12.

Present—Messrs. F. Jacobs (in chair), C. Lewis, J. Richards, J. Metcalf, G. Hicks, G. Brumby, and C. Ricks (Hon. Sec.).

EXPERIMENTS.—Mr. Brumby tabled sample of Mackay pea from Bureau seed; this was a failure for garden work.

Protection of Birds.—It was decided to ask the local schoolmaster to particularly impress on the school children the necessity for protecting their insect-eating birds.

Black Spot of Potatoes.—Members reported potato crops very light. They had suffered considerably from leaf spot disease, the light-skinned varieties being most affected.

Annual Report.—The Hon. Secretary's annual report showed that twelve meetings had been held, with an average attendance of eleven members. Messrs. R. Gibbins and C. Ricks were re-elected Chairman and Hon. Secretary for ensuing year, and thanked for their services.

Wilson, December 15.

Present—Messrs. W. H. Neal (in chair), R. Rowe, T. Matthews, T. Barnes, H. Need, H. T. Crossman, A. Crossman, A. Canning (Hon. Sec.), and two visitors.

Rabbits.—Reference was made to the damage done by rabbits, and discussion ensued on poisoning. Mr. Matthews promised to try poisoning with cyanide of potassium, which had been referred to in the daily press.

Cultivation.—A discussion took place on best manner of working the land in these dry areas. Mr. Need considered good ploughing, especially when fallowing, to give the best results, but there were times when on the score of cheapness and absence of sufficient strength of teams it was hardly possible to give the land the work required. The light white lands, of which they had such a large area, required different treatment to the heavier red lands. If ploughed deeply the wheat did not do well. Fallow generally gave best results with this land. Ploughing should be done as much as possible in the winter. Ploughing one year and scarifying the next often gave satisfactory returns, and was cheap—a very great consideration when feed is scarce. Mr. Neal favored deep ploughing, but noticed that if a dry year followed land ploughed deeply did not give such good results as shallower cultivated land. They had a number of instances of this this year. Mr. Rowe considered 4in deep enough to fallow in this district. The white land worked wet did much better than if worked dry. He favored loosening the land after rain by running the cultivator or harrows over it after the crop was up. Members considered more seed per acre should be sown on the white land than on the darker soils.

Manure Experiments.—A committee was appointed to carry out various experiments with fertilisers during the coming season.

Exhibits.—The Hon. Secretary tabled sample of onions grown on the school plots. They were considered to be very good for the season, especially as the tops were eaten down by the locusts early in the season. A double-headed stalk of wheat was tabled by one of the members.

Mount Remarkable, December 14.

Present—Messrs. D. Roper (in chair), W. Lange, T. P. Yates, J. B. Murrell, H B. Ewens, and T. Casley (Hon. Sec.)

Dairying.—Mr. J. A. Girdham reported safe arrival of Jersey Bull (Laddie Warwick) loaned by the Department of Agriculture to the Branch.

Wool-sorting.—Mr. Roper called attention to proposal to form wool-sorting classes in country districts. A class was to be formed at Melrose.

Eudunda, December 18.

Present—Messrs. E. Wainwright (in chair), A. Kluske, W. F. Krummel, J. A. Pfitzner, E. Schier, C. L. E. Lutz, and H. D. Weil (Hon. Sec.).

Business.—A good deal of formal business was transacted.

Experimental Work.—Mr. Kluske reported that none of the seeds received from Central Bureau in August last came up. This was probably owing to the absence of rain. He promised to report on results of work on the experimental block at next meeting.

Stockport, December 18.

Present—Messrs. J. Smith (Chairman), D. G. Stribling, C. W. Smith, J. Smith, jun., T. Megaw, J. F. Godfree, P. Hogan, and J. Murray (Hon. Sec.)

Stripping and Clearing.—Mr. J. Smith read a paper on this subject. He had tried hand reaping, but it is very slow work. By use of the binder and header you get more grain, and save more and better feed for the stock; but he did not think the results pay for the extra expense and labor. He preferred the stripper for its quickness, cheapness, and economy of labor It is desirable to put on as many strippers as possible, to get the crop in heaps on a good, clean, hard floor—concrete by preference—and on rising ground, higher in the centre, to throw off any wet from thunderstorms. If a shed could be provided it would be all the more pleasant for winnowing. Every effort should be made to secure a good clean even sample. He would like to see more general use made of straw.

Harvesting.—Mr. P. Hogan followed with a paper on "Harvesting." Much labor, time, and anxiety can be avoided by forethought, and by having everything in readiness by the time the crops are ready for reaping. A day or two lost from any cause when the hay or wheat crop is quite ready may mean heavy loss before the harvest is got over. Get all implements, &c., in perfect order at least a month before they are likely to be wanted. Opinions differ as to when is the best time to cut hay; but as it is not possible to cut a large quantity all at once, we must begin directly the bloom falls, and continue until it is all cut. Hay should be sheaved and put up either in long or round stooks, with twenty-five to thirty sheaves in each. It is not advisable to stook it too green, unless they can stand a fortnight before stacking. If the weather is cool and damp great care must be taken not to stack too soon. There is a great tendency with sheaved hay to slip. For foundation of the stack put down a load or two of straw or cocky chaff. The sides of the stack should be quite upright, as in settling there will be an outward tendency. Keep the centre 2ft. or 3ft. higher than the outside, and as the stack approaches completion the centre should be made gradually higher When starting to top up it is a good plan to project a row of longest sheaves 6in. or 8in. beyond the eaves. This will throw the rain off. Square corners are easiest to build, but some farmers prefer round ends. From 15ft. to 18ft. is plenty wide enough, and it is a great mistake to make stacks too large. Fifty to sixty tons is enough for one stack. Wheat harvest should commence directly the crop is ready. Do not wait until the last head is dead ripe. For the wheat heap select a solid, clean, and even surface Some farmers choose the highest parts of the field, and there are some points in favor of this, but every machine full must be dragged up hill, and if the ground is heavy this causes much unnecessary labor. Mark the floors off before ploughing, and do not even run the harrows over. It is a hard matter to clean earth and smooth stones out of wheat. He thought the binder and header could with advantage be used on a limited scale by most farmers, because the binder can be put on the crops before they are dead ripe enough for the stripper, and there is less risk of loss from heavy winds, rain, fire, &c. The binder can also be used when the weather is too cold or damp for the stripper to be used. The straw, too, will make useful fodder, and may be chaffed along with good hay to serve as food for horses. The wheat should be thoroughly cleaned for marketing; but the merchants should pay an extra price for all clean wheat weighing over the standard if they are allowed to dock for all under the standard. If this were done it would be an inducement to many farmers to clean their wheat better.

Mr. Hogan, in reply to a question, said the damp-weather stripper could be started an hour or two earlier on a damp day, and the wheat is easier to clean than when harvested with the ordinary stripper. Mr. Stribling advised members to get shafts, wheels, and baggers put on their winnowers as these save much time and labor. In reply to a question whether straw of frostbitten wheat makes good fodder, the Chairman said he had noticed that where wheat was stunted in growth the stock would clear such patches before going where the growth was stronger.

Clarendon, December 14.

Present—Messrs. J. Spencer (in chair), A. Harper, R. Hilton, W. Spencer, J. Pelling, H. Payne, J. Piggott, and A. L. Morphett (Hon. Sec.).

Best Kind of Animal on Farms.—Mr. Payne read a paper, in which he came to the conclusion that the cow is the most generally useful and profitable animal that can be kept on a farm. Some members thought the sheep is the most useful animal; others preferred the horse, and others the cow, but no finality of opinion was arrived at.

Non-attendance.—It was decided to strike off the list of members those who fail in future to attend three successive meetings. [Good resolution; stick to it.—Gen. Sec.]

Riverton, December 16.

Present- Dr Allwork, Messrs. T. Gravestock, M. Nash, W. Hannaford, and H. A. Hussey (Hon. Sec.).

Washing Sheep.—Mr. Gravestock initiated a discussion on "Will it pay to wash sheep at present prices?" The discussion was postponed owing to small attendance, due to harvesting operations. Members would like to have the opinions of members of other Branches on this subject.

Dowlingville, November 17.

Present—Messrs. R. A. Montgomery (Chairman), T. Illman, J. Phelps, J. L. Broadbent, G. Inkster, S. W. Tee, J. Birkin, F. W. Roberts (Hon. Sec.), and two visitors.

Bluestone.—It was decided to request the Central Bureau to consider and submit to the various Branches the resolution passed at previous meeting of this Branch, asking that an Act should be passed requiring vendors of bluestone to give a written guarantee of purity.

Mice Plague.—Mr. Birkin stated that he had seen a wheat stack this season very badly injured by mice. Bags that had contained lime previously were but slightly damaged.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— December 31, 1899.

With the exception of a couple of short hot spells, the weather during the past month has been agreeable, and the spring altogether unusually cool. Dry weather prevailed until the 26th, when good rains fell over the coastal and South-Eastern districts, although not reaching far inland. The change has been acceptable, but beyond replenishing tanks and dams, besides freshening up gardens, the rains can have done very little good. The hay crop has been nearly all gathered, and most of the wheat reaped, excepting in the later districts. The quality of the grain this season is said to be exceptionally good, some flour that has already been made from the new wheat turning out very superior. The pastoral industry continues to look encouraging, and, as we anticipated, there is a movement now setting in for the re-occupation of some of the country which had been abandoned as the result of droughts and the low price of wool.

Business is generally brisk during December, and this year has proved no exception, although the low price that farmers are obtaining for their cereals prevents any active rebound in country trade; still, in the centres of population retailers seem to have had a very fair Christmas trade. Steady development continues to be made in the opening up of minerals, especially copper, the future of which metal, according to the world's greatest authorities, seems to be assured for some time to come.

In breadstuffs values have ruled disappointingly flat, the predicted activity not yet showing. In Europe the market seems to be controlled just now by the "bears," who are apparently hazarding exaggerated opinions as to the stocks of wheat, especially in the United States and Canada, and also reporting that a phenomenal crop is being reaped in Argentine. This latter country seems now to hold the position formerly accredited to the United States, and latterly to India, as a country which could so cheaply deliver wheat in Europe that all other places would be unable to compete; but this bugbear has lost a deal of its potency, and with the opening of the new year a different aspect may be presented in Mark Lane, as some leading authorities hold the opinion strongly that the admitted depression now prevailing in the breadstuffs market is caused chiefly by the tightness of money and high rates of interest ruling, which naturally, of course, lessens speculation. The Australian market has further eased, partly owing to the difficulties of obtaining suitable vessels; but in this South Australia at moment seems to be rather better off than her neighbors, if one may judge by the fact that wheat is ruling somewhat higher here than with them, though our superior quality this season may account for this. Millers' offal has been very brisk without any export trade, bran and pollard ruling at rates that cannot, however, be expected to sustain; in fact, values already have commenced to weaken. There has not been much trade doing in feeding grains; still prices fairly maintain. Hay appears to be more firmly held, but as chaff can still be obtained as cheaply, and the eastern colonies, it is reported, will have sufficient to provide for their wants, whilst Western Australia will only require a lessened quantity, the outlook in forage lines does not seem any too bright, although some turn with confidence towards South Africa for relief.

Under the influence of heavy supplies of earlies in Victoria price of potatoes rapidly tumbled down soon after we last reported, although at moment the tendency is towards firmness. Any marked advance here, however, is improbable whilst intercolonial quotations rule so low. The crops in the district south of Adelaide are not likely to yield as heavily as was expected a month ago, but the prospects of the Mount Gambier crops are favorable. The supply of onions has been ample for all requirements, so that although the quality of later samples shows improvement price has further eased.

Dairy lines have received full attention, and the course of trade in butter has resulted as we anticipated in our last month's report, local demand steadily overtaking supplies, so that now there is only a small surplus of low grade available for export, whilst higher prices are being obtained for top qualities. In eggs strong export demand caused values to steadily improve until Christmas orders for Western Australia were filled, when a rapid reduction occurred, but as we write prices again seem inclined to recover. Seasonable trade has been doing in hams, whilst in bacon there is an increased consumption shown. The low price of cheese which has, we think, been unnecessarily caused by the anxiety of some holders to effect quittance may partly account for the larger quantities moved, but at a great sacrifice of value. Honey is coming forward more freely, but demand is only moderate. Beeswax and almonds scarce.

The usual heavy month's business for time of year was put through in poultry, but consigners that forwarded their birds early in the month realised good profits, whilst lots reaching the city on the eve of the holidays, after buyers had mostly secured their wants, sold indifferently, especially for poor and medium condition.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 7d.; old, 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 15s. to £7; country, £6 10s. to £6 15s. per ton of 2,000lbs.

Bran, 9½d.; pollard, 10d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 7d. to 1s. 10d.; good stout white, 2s. 5d. to 2s. 10d. per bushel of 40lbs.

Barley. - Malting, nominal; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 5s. to £3 10s. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Local, new, £4; Imported, old, £3 10s. to £3 15s. per 2,240lbs.

Onions.—£2 10s. to £2 15s. per 2,240lbs.

Butter.—Creamery and factory prints, 8½d. to 10d.; bulk, 8½d. to 9d.; dairy and collectors' lines, 6½d. to 8d. per pound.

Cheese.—S.A. factory, best, 6d. to 6¾d.; ordinary to fair 4½d. to 5½d. per pound.

Bacon.—Factory-cured sides, 6¼d. to 6¾d.; farm lots, 5½d. to 6d. per pound.

Hams.—S.A. factory, scarce, 7d. to 9d. per pound.

Eggs.—Loose, 5½d.; in casks, f.o.b., 7½d. per dozen.

Lard.—In bladders, 4½d.; tins, 4d. per pound.

Honey.—New, 2¾d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 5d. to 5½d.; kernels, 1s. 1½d. per pound.

Gum.—Best clear wattle, 1¾d. per pound.

Live Poultry.—For good young roosters 1s. 5d. to 1s. 8d.; prime sorts up to 2s. 4d.; medium condition cockerels and nice hens, 1s. to 1s. 4d; small ducks, 1s. 3d. to 1s. 7d.; heavy birds, 1s. 8d. to 2s. 5d.; prime heavy geese from 3s. 7d. to 4s.; medium to good, 2s. 9d. to 3s. 3d.; goslings and poor birds from 2s. to 2s. 6d.; pigeons, 7d.; fine quality table turkeys scarce at from 7d. to 8d.; ordinary sorts from 6d. to 7d. per pound live weight.

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NOTES AND COMMENTS.

The weather during the past month has been on the whole very favorable to the completion of harvesting operations. In many cases the results from cleaning-up operations have been disappointing, the crops not yielding up to expectations, and there is no doubt that the frost and hot winds did more damage than was thought. Large stacks of wheat are accumulating at the various centres, but the low price is causing disappointment, and many farmers are holding their wheat in hopes of higher prices later on. Stone fruit on the whole has not been plentiful, and high prices have been realised.

The corn trade section of the Adelaide Chamber of Commerce met on Wednesday, January 10, and fixed the standard weight of wheat for the ensuing season at 63lbs. to the bushel, which is the same as agreed upon last year. The standard weight of wheat during the past eight years has been as follows:—1893, 62½lbs ; 1894, 63lbs.; 1895, 62½lbs.; 1896, 63lbs.; 1897, 63lbs.; 1898, 62lbs.; 1899, 63lbs.; 1900, 63lbs. The sample sent to the Department of Agriculture as the standard sample of South Australian wheat is no credit to the colony, and we have little hesitation in saying that wheat so badly cleaned would in most cases be rejected by the wheatbuyers. It is difficult to understand how the sample comes to be of such inferior character, seeing that it is supposed to be an average of the wheat purchased at full market price. That some of the wheat sent to the Chamber of Commerce was badly bunted is very evident.

Mr. C. H. T. Connor, of the Adelaide Milling Co., in his review of the past year's transactions in wheat and flour, states that last year 3,149,889bush. of wheat and 49,865 tons of flour were exported from South Australia, showing an increase of 3,089,146bush. wheat, and 27,748 tons of flour over the exports for the previous year. The exports represent 151,155 tons of wheat, while it is estimated that 6,000 tons are held at the various shipping ports and railway stations, besides the quantity of last season's wheat still held by the farmers. Last year's export was the largest since 1895, when 167,958 tons of breadstuffs were exported. A noticeable feature of the returns is that 715,419bush. of wheat and 14,708 tons of flour were sent to South Africa.

It has been stated that if wheat bags are dipped in a solution of 1lb. alum to 10galls. of water and then dried before the grain is placed in them, mice will not gnaw through the bags. If this is correct it should prove a very cheap and simple way of preventing the enormous damages caused by mice getting into the wheat stacks.

The art of grading and packing of fruit for market or for export is very little understood in the Australasian colonies. We take no end of trouble in cultivating fruit, and when it is ripe and ready for the purchaser, we dump it into big boxes and bruise it, so that within twenty-four hours it is half rotten, and the flavor, aroma, and attractive appearance are ruined. Continental growers of fruit do not spare any pains in getting up their fruit for market, and even go so far as to pack cherries and plums in honeycomb boxes, each individual fruit in a separate compartment; and it pays them well to do so.

The horse bot, or gadfly, has made its presence evident in the South-East, and has even been discovered near Echunga. This fly deposits its eggs around the lips and on the hair of the horse wherever the animal is able to reach with its mouth. The larvæ, or the eggs, cause an irritation, and the horse bites or licks them off, so that they gain an entrance to the stomach, where the maggots or "bots" come to life, and in many cases perforate the stomach and intestines and cause the death of their host. To prevent this the hair should be kept closely clipped, the places smeared with kerosene, grease, or tar, the horse curried and brushed all over every day, and all manure buried or burned. A farmer in New Zealand says he has discovered a remedy for bots in horses. He gives them some raw potatoes. This is worthy of a trial, and results should be reported for the good of others.

Ten years ago the Central Agricultural Bureau of South Australia was greatly ridiculed in some quarters, because of its anxiety concerning the possibility of introduction of the Hessian fly from New Zealand. The fly is more than ever prevalent in some parts of that colony at present, and many of our neighbors in the eastern colonies are alarmed at the prospect of this fearful pest being introduced with seed wheat, straw, or other means.

In Germany upwards of 48,000 acres of swampy land are drained and used for the cultivation of osier willows, and more than 40,000 people are employed in this work, and in basket weaving. In our South-east country there is ample room for the growth of osiers, and there is a good demand for them at profitable prices. South-Eastern potatoes and onions are frequently damaged in transit to market, through being sent up in bags, but this damage would not occur if baskets were used. The baskets should be made to "nest" within each other, so that "return empties" can be packed closely.

The disastrous "bush" fires which have occurred in the South-East and in several other parts of South Australia, as well as in the adjacent colonies, lately have been only a repetition of what have occurred only too regularly year after year during summer and autumn, and the question may fairly be asked, "Are not these occurrences due in most cases to neglect of ordinary common-sense precautions on the part of farmers and other settlers?" Surely it ought to be possible to guard against the extension of a grass fire or bush fire over more than a limited area from the centre of its occurrence. When the fire has once started in heavily grassed country it is next to impossible to beat it out, but the proper time to take precautions is before any fire has started. For this purpose a co-operation of those interested is necessary.

The following extract from the London *Times* of November 23 has been forwarded by our Agent-General, Sir J. A. Cockburn, K.C.M.G., who inaugurated "Arbor Day" for our public schools in South Australia:—"Italy, Rome, November 21. The interesting ceremony known as the 'Festa degli alberi,' or 'tree day,' took place this morning in the presence of Queen Margherita, on the Via Latina. Some 7,000 children from various Roman schools took part in the ceremony, which consisted chiefly in planting a large number of young trees. 'Tree day' has been organised by Professor Baccelli, Minister of Public Instruction, in order to instil into the minds of Italian children reverence for, and a sense of the value of, trees, and to stimulate the replanting of trees throughout Italy. Professor Baccelli deserves hearty congratulation upon his public-spirited initiative."

Complaints of extensive damages to grass paddocks by root-eating "grubs" have been made in this colony as well as in Victoria and New South Wales. Specimens of the grubs have been sent to the office of the Agricultural Bureau, and these are undoubtedly two species at least, but it is hardly possible to identify the pests in their larval (or incomplete) form. One, about 1in. long, has a brown head with powerful jaws, a brown spot at the other end, and has a yellowish white body. The other is 1in. long, has a head very like that of a cheese maggot, and both ends drawn out to a point. The first, without doubt, feeds upon the roots of the plants, but it may be that the other one preys upon the grass grubs.

Nitrogen causes luxuriance in the growth of plants, and if it is too abundant in the soil, or if there is a deficiency of potash and phosphoric acid, the plant will give a poor crop of seed or fruit. Nitrogen is the most costly of the fertilisers, and is easily dissolved and carried by water beyond reach by the roots of plants, therefore great care is needed to avoid waste, and no more should be applied than is likely to be required by the growing crop. At the same time, there must be a sufficiency of phosphoric acid and potash in the soil to ensure the full and perfect maturation of the crop:

"Newspaper science" is not always reliable. For instance, the latest issue of a very prominent Sydney paper says that of course the name "deaf adder" is wrong, because the snake is not deaf but is deadly, therefore the proper name is "death adder." As a matter of fact the name "deaf" adder was given because it is supposed to be insensible to the charms of music. In the same issue of that paper the editor informs an anxious inquirer that the proper way to remove ticks from a dog is to cut the ticks close off, and then apply any kind of oil. This would result in a nasty abscess. The proper thing is to saturate the ticks with kerosene or any kind of oil, and leave the ticks to drop off. In a recent official inquiry *re* codlin moth, a jam-maker on an extensive scale gravely stated that he had seen the caterpillars of the codlin moth in tomatoes and potatoes, but had he been better acquainted with entomology he would have known that the caterpillars in tomatoes were those of a moth known as Cacaesia sp., and those in the potatoes were those of Lita solanella. The codlin moth caterpillars differ in many points of resemblance from the other two, which also differ from each other. The same gentleman made several other emphatic statements which were equally ridiculous and ill-founded, but which were likely, if broadly published, to bring our local fruit into most undeserved ill-repute.

With the view to discovering a preventive of Texas fever (here called tick fever) in cattle, very many experiments have been conducted by M. Francis, Veterinarian of Texas Experiment Station, and J. W. Connaway, Veterinarian of Missouri Experiment Station, U.S.A., and the results are given in Bulletin No. 53 of the Texas Experimental Station, Veterinary Section, October, 1899. The final results of inoculation with sterile serum show that such material possesses no protective properties, but immunising by tick infestation can be employed with success; but on account of maintaining a quarantined pasture, and the necessity of hand-feeding in the case of calves of non-immune cows, this method is not as desirable as that of blood inoculation. In the blood inoculation experiments over 400 pure-bred cattle have been used. The losses from inoculation and from subsequent exposure to infected pastures in Texas have been less than 8 per cent.

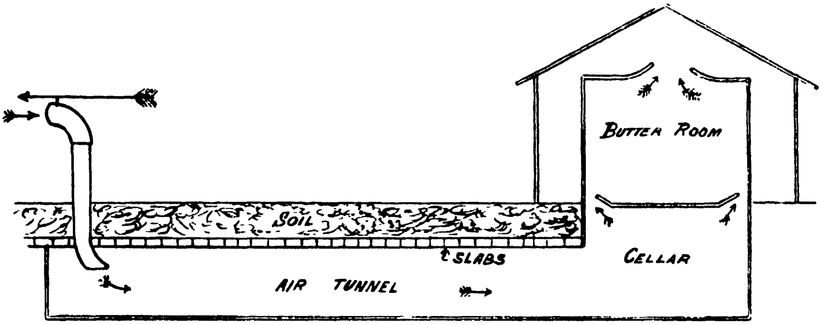
HOW TO RAISE SUGAR GUMS IN BOXES.

A gentleman who formerly was in the service of the Forest Department under the late J. Ednie Brown, F.L.S., writes that it is often difficult to procure bamboo tubes for raising seedling sugar gums, but that the trees can be raised in common brandy cases. These should be filled to within 2in. or 3in. of the top with finely-sifted soil from where a wood heap has stood; or, if that is not procurable, then use a dark, rich, light sandy loam. Sow the seeds *very thinly* and carefully on the fine level surface—say, about 1in. apart —and then cover not more than ¼in. deep with very fine light loamy soil of a sandy nature. Water every morning at about 9 o'clock and again at sundown, using a very fine rose on the watering-pot. (If a coarse rose is used the water will disturb the soil, and wash the seeds away.) If it is found that the plants stand too thickly, the excess should be thinned out when three weeks to a month old. Sowing is generally done during January or February, and the young trees are usually planted out during June, July, or August. They are subject to injury from frost when young, and the transplanting has to be governed by the nature of the locality in this respect. It is desirable to put some kind of a shelter over the seedlings in the boxes, but provision must be made for the plants to have plenty of light without the direct rays of the sun falling continuously upon the young trees.

To **Destroy Lichen.**—Moss or lichen on fruit trees is usually a sign of lack of vitality, and generally follows neglect to cultivate and prune. Where stems and branches are thickly affected they should be well scraped. Hot lime wash or Bordeaux mixture sprayed in the winter will destroy the moss or lichen.

A COOL DAIRY ROOM.

There is much difficulty on most farms in Australasia in keeping the dairy room sufficiently cool in summer to maintain a firm condition in the butter. Factories can be provided with refrigerators at a low cost, but the dairyman working with twenty to thirty cows cannot afford to use machinery of that sort, and such persons will be pleased with the substitute here shown :—



The idea is credited to American ingenuity, but something of a similar nature has been used by several Australian dairymen for many years past. The knowledge that the earth's temperature at about 12ft. below the surface is constantly maintained at about 60° F. in most places is valuable to many people, especially to dairymen; but in order to secure a draught of cool air into an over-surface room there must be a considerable area of underground tunnelling. In the illustration, drawn from memory of a similar one in an American paper, the butter-room is built with double walls of tongued and grooved boards within the dairy. It would be more effective if covered outside with "cowhair" cloth, but this would be costly. Between the walls should be filled with charcoal or cocky chaff. The flooring-boards should not reach to the walls by about an inch all round, and the skirting-boards should be put on slanting inwards at the bottom, and be scolloped at top, so as to allow of the air coming up from the tunnel below. The tunnel should lead into a cellar beneath the butter-room, and may be 5ft. or 6ft. high and 2ft. to 4ft. wide, with a length of not less than 60ft., but the longer the better. Between the top of the tunnel and the surface of the earth there should be a depth of at least 4ft. of soil. The top or roof of the tunnel may be covered with slabs or slates or any substance that will keep out the soil, &c., and at the outer end of the tunnel should be a pipe, say 8in diameter, leading to a sufficient height in the air, and this should be fitted with a cowl and vane to face every breeze that blows, and carry it down into the tunnel and thence along to the cellar and to the butter-room.

VARIETIES OF CHEESE.

By G. S. Thomson, N.D.D.

Inquiries are occasionally made concerning the systems of manufacture of different varieties of cheese. The only kind of cheese made in our colony is the Cheddar, all blue-veined varieties being imported from England or New Zealand. Should any of our factories feel inclined to turn their attention to the manufacture, on a small scale, of one or more of the cheeses named in this article, I will be pleased to give the necessary instruction. The systems of manufacture given are practised at the British Dairy Institute, England, and are partly written from notes taken during a course of training there, and from memory. The following are the leading varieties of cheese :—

Hard Pressed—
Cheddar
Cheshire
Lancashire
Leicester
Gloucester (Single and double)
Derbyshire
Wiltshire
Cleveland
Dunlop
Caerphilly

Blue Veined—
Stilton
Wensleydale
Gorgonzola
Dorset Blue

Soft Cheeses—
Camembert
Cambridge
Coulomnier
Cream Cheese.

Other Varieties—Pont l'Eveque, Brie, Bondon, Gervais.

Cheshire.

In the hard-pressed class let us consider the system of manufacture of Cheshire, which has a close relationship to Cheddar. In England the popular size of a Cheshire is about 13in. by 13in., and from 65lbs. to 70lbs. in weight.

Medium-ripening or long-ripening cheeses are now preferred to the quick-maturing and less digestible ones The milk for a Cheshire is very similar in condition to that required for good Cheddar, but it is considered desirable to have it a shade sweeter, testing from twenty-two to twenty-three seconds.

Coloring is added at the rate of 1drm. to 5galls. (Fallwood & Bland's), and well stirred into the milk for a period of ten minutes. The time occupied in coagulation of the milk compares with Cheddar, but a finer cut curd is required, with an acidity in the whey of about 0·13 on the acidometer. After cutting, the curd is stirred for twenty minutes with the hands, this being done to avoid loss of fat and casein, which would result if the rake were used. Heat is applied after cutting, and the temperature is gradually raised to 90° F., the cooking being continued for an average of one hour. After scalding, the curd is allowed to settle in the whey, or "pitch," as it is sometimes called, until it contracts and leaves a clear space around the sides of the vat. When reading 0·17 of lactic acid the whey is drained off. The curd is then rolled up, and subsequently placed on a rack on the bottom of the vat and broken up. When fairly dry and tears in strings and has an acidity of about 0·6 the curd is ready to mill. Compared with Cheddar it is milled much finer, and is salted at the rate of 1oz. to 3lbs. When hooping no pressure is applied with the hands, and the cheese must be put into a room having a temperature not lower than 70° F. The same evening a fresh cloth is applied and the cheese left to drain until the following morning. It is now put into press with a pressure of 6cwts. followed by 10cwts. for the first day, 15cwts. for the second day, 20cwts. for the third, and 25cwts. for the fourth. When taken to the ripening-room Cheshires must be turned twice daily for the first fortnight during hot weather.

Soapy cheeses which bulge and heave are due to insufficient acidity, and this is what one must be very careful to avoid in making Cheshire.

Stilton.

For Stilton cheese-making the milk must be perfectly new and sweet. Fifteen gallons are required to make one cheese weighing about 25lbs. of curd. Rennet is added at the rate of 1drm. to 4galls., at a temperature of 83° F., and is stirred into the milk for six minutes. In one and a quarter hours the coagulated milk is ladled out into cloths suspended over a drainer, where it is allowed to drain and lie in the whey for two hours; afterwards the whey is run off. The cloths are usually tightened at the end of one hour from draining, and at intervals of two to three hours; but care must be taken not to over-do the tightening. When the curd is sufficiently firm to handle it is emptied out into coolers, and allowed to remain in its whey until the following day. When 0·8 per cent. of acid has developed, salting is proceeded with, 1oz. of salt to every 4lbs. of curd being considered sufficient. In hooping the curd hand pressure must be applied gently. The green cheeses are now removed to drain, which usually occupies about seven days, according to the acidity of the curd and the temperature of the room. The next step is to take off the hoops, scrape the cheeses all round, also on top and bottom, and bandage, return to the hoop; and continue to do this daily for four days. At the expiry of that time the Stiltons are placed in a drying-room, which must be free from draughts. The cheeses must be closely watched, and when a crust is seen to form, with no appearance of moisture on the outside, they are finally removed to the ripening-room.

Stilton Cheese Faults.—Cheeses which drain under three days are too acid. When a long time is occupied in draining, say over nine days, the cause is attributed to a sweet curd or a chill in the ripening-room.

Hard dry Stiltons are the result of an excess of acid or by either being too long in the coating-room or too dry in the ripening-room.

Coulomnier.

Three gallons of sweet milk at a temperature of 84° F. is renneted with ½ c.c. of rennet and stirred for five minutes. Six hours is given for coagulation, and during the first half of that time the milk is stirred at intervals to prevent the cream rising to the surface. When the milk is coagulated the curd is ladled out into double moulds, placed on straw mats, having boards underneath. After the curd has settled into the lower half of mould the cheeses are turned. When sufficiently firm, salt is rubbed into each side alternately for several times. The period of ripening for Coulomnier is from five to six weeks.

Cream Cheese.

Six quarts of cream at 70° F. is coagulated with twelve drops of rennet. After stirring for five minutes the cream is left for twenty-four hours. It is then ladled into cloths and hung up for twelve hours to drain. Every four hours during draining the curd is scraped away from the sides of the cloth to facilitate the escape of the whey. A weight is afterwards put upon the cloth for twenty-four hours, scraping of the curd being continued a couple of times throughout pressing. The curd is then ready for the mould.

It must be understood that alterations in the making of the above cheeses in this colony would be learned from experience.

AGRICULTURAL AND LIVE STOCK STATISTICS.

In the September, 1899, issue we published a preliminary summary of the agricultural and live stock statistics for year ending March 31, 1899, and the following extracts from the annual report of the Government Statist for the same period will be of interest in connection with the figures previously published:—

Following the usual practice existing amongst statistical departments, preliminary returns are issued from time to time, every effort being made to afford the earliest information to the public—such as the summary of the wheat and hay harvests, which were gazetted on the 6th April. Summaries giving full particulars of the agricultural and live stock returns in each county were published on the 12th August, simultaneously with those of the other colonies. A synopsis of these returns is also published in the *Journal of Agriculture and Industry*. Complete details and comparative tables in the usual form necessary for ascertaining the position of the producing interests from time to time form a permanent record, now extending over forty years.

Under agreement come to at a conference of statists, held in 1861, practical uniformity was secured in the method of compiling information acquired throughout the Australian colonies as to agriculture and kindred subjects. Based on the same lines as those of the United Kingdom the Australasian statistics are incorporated with the returns of the Board of Trade, and have widespread publicity.

South Australia—erstwhile the granary of Australia—has practically been built up by the production of cereals. For several years, however, the farmers have engaged largely in other branches of husbandry, devoting more attention to grazing, sheep-breeding, dairying, and kindred occupations, rendering themselves less and less dependent on wheat production. For example, up to the time of the drought many more cattle and sheep were kept on farms in the Lower and Upper North than there had been before the lands were thrown open to agricultural settlement, districts which ordinarily supply two-thirds of the whole wheat crop. Twenty years ago the area cultivated within the counties was 2,270,655 acres, and the sheep kept 4,548,447. At present 2,967,370 acres are tilled and 4,002,815 sheep depastured. The area cultivated shows an increase of 363,248 acres, or 14 per cent. on the preceding year, whilst the number of sheep is the same.

The rainfall in each division was as follows, the figures in parentheses being those of the previous season:—Central, 17·24 (13·3); Lower North, 12·76 (9·79); Upper North, 8·69 (6·19); South-East, 21·29 (17·55); and Western, 11·64 (9·11) inches.

Farmers who are also sheep-breeders and graziers have an excellent prospect before them, and it is satisfactory to note that last year neither the flocks nor dairy herds decreased in number. The re-stocking of the pastoral districts, an increasing export of frozen lambs and dairy produce, and the high prices likely to continue for some time for wool, skins, and kindred products, are elements which make for prosperity in the near future.

The season opened propitiously, and seeding was carried on under favorable conditions, the area planted being much enlarged. Each month from April to August the rainfall generally was quite above the average, and the plant made strong growth. Instead, however, of ordinary spring weather following in September and October, hot weather and drying winds prevailed, and without the full supply of rain usually prevalent all hope of a bountiful harvest, justified by the early promise of the season, vanished. Towards the close of October good rains fell, benefiting the crops generally, more especially in weight of the grain, and increasing the yield of those sown late. This rain did not reach the Upper North, and the crops there were practically gone. Throughout the agricultural areas the rainfall for the six autumn and winter months was well above the average, but the dry spell at the critical period (September, October) was fatal in the Upper North.

One of the lessons taught by the late drought has been to impress upon farmers that, even in dry seasons, careful husbandry and the adoption of modern systems will ensure returns for their labor otherwise unobtainable. Utilising sheep in the stubbles and on the fallows, thereby clearing the land of wild oats and noxious weeds, is very general, as also is early sowing with the aid of the drill, depositing such chemical manures as are required by the soil to produce good and clean crops of superior grain. Ground so husbanded has yielded more than double the return in frequent instances, and it is not too much to predict that this great reformation will conduce to the fuller development of the staple product of the country, and increase the value of real estate. Not many years ago the use of artificial manures was, except to a few, unknown on farms; at present about 400,000 acres, or one-fourth of the entire crop, is so treated. Since 1896 the quantity of imported fertilisers has increased from 770 to 12,532 tons, whilst the use of those locally made has also been largely augmented.

The total quantity of wheat reaped in 1898-9 was 8,778,800bush., compared with 4,014,852bush. in the previous year. The increase amounted to 4,764,048bush., or more than double the preceding crop, the second of the drought. The average yield was 4·91, as against 2·64bush. the year before.

In speaking of the average yield as being low in comparison with other places, where the bulk of the land is virgin soil or only a few years under cultivation, it must not be overlooked that out of the 1,788,700 acres of wheat reaped, more than one-third (667,302 acres) were grown in the Upper North and Western Divisions, where the drought had not yet ceased. Although the average of the colony was 5bush. (4·91), that of the three earlier settled divisions (the Central, Lower North, and South-Eastern), was 6·2, whilst that of the Upper North and Western was only 2·75bush., so reducing the average return for the whole crop.

After three years unprecedented drought, during which the heavy losses in live stock experienced by many farmers and pastoralists were almost disastrous, it is most satisfactory to record that if there has been no addition to the number of the flocks and herds there has at all events been only a nominal reduction during the past season.

Horses were returned as numbering 161,774, compared with 164,820 in 1898—a decrease of 3,046, or 1·85 per cent. The loss of horses in the agricultural areas was 529, or 0·35 per cent, and in the pastoral districts 2,517, or 17·43 per cent. The number of working stock included in above was 116,073, against 114,851—a decrease of 1,222, or 1·06 per cent.

Compared with the previous year there are now 260,343 head of cattle, as against 274,255—a decrease of 13,912, or 5·07 per cent., during the twelve months. In the pastoral districts there are 86,563 head, against 98,998—a decrease of 12,435, or 12·56 per cent. In the counties there are 173,780, compared with 175,257 a year ago, or a decrease of 1,477, or 0·84 per cent.

Dairy herds show an increase, the number of milch cows being 76,059, as against 72,871, or 3,188 more. They are distributed as follows:—Central division, 40,483; Lower North, 14,729; Upper North, 9,996; South-East, 9,389; Western, 1,453; and 650 outside of counties.

Stimulated by the grant of an export bonus of 2d. per pound, authorised by Parliament in 1893 (Act 565, now expired), an extraordinary extension of the dairying business resulted, only checked for a time by the extreme drought. In 1892 there existed twenty-five butter and cheese factories; now there are sixty-three working, described as sixteen butter and cheese, thirty-four butter, eight cheese, and fifteen creameries. The returns show the number of milch cows and the quantities of butter and cheese made in each district, which information will be useful to those engaged in this valuable industry.

Fifty per cent. more butter was made in 1896 than in 1892. The actual quantity specified was 4,616,675lbs., as compared with 3,110,093lbs. The cheese made was 907,123lbs., against 661,314lbs., or 37 per cent. additional. In 1892, 212,981lbs., value £9,851; in 1893, 644,841lbs., value £20,693; in 1894, 1,542,740lbs., value £54,080; and in 1895, 1,733,420lbs., value £70,459. In 1898 the quantity of butter made was 4,559,683lbs., and of cheese

923,123lbs., showing increases of 659,565lbs. and 73,278lbs. respectively. Owing to the drought only 605,301lbs. of butter, value £26,194, were exported in 1896, and in 1897 but 166,213lbs., value £6,879, from the same cause. In 1898, however, 769,393lbs., value £28,007, were shipped. The total export of butter during the last ten years was 7,093,565lbs., of £272,275 value.

The meat supply was again greatly reduced, fat stock being almost unprocurable throughout the season, prices considerably advancing. The total number of cattle imported overland was 23,535, against 1,801 exported, leaving a net import of 21,734 head against 13,912 in the previous year. During the last ten years 170,521 head have been imported, chiefly fat stock from Queensland.

Last year 288,783 sheep were imported and 63,894 exported, or 224,889 in excess. During the ten years 2,564,386 sheep were introduced, as compared with 931,613 crossed the border outwards, showing an addition of 1,632,773 within that period, from which it appears that that number of sheep, in addition to 153,130 head of cattle, have been required for food consumption beyond the local sources of supply.

Four-fifths of the sheep are depastured within the boundaries of counties, and the remainder in the outside pastoral districts, in which case they are owned by sheepfarmers under the leasing clauses of the Crown Lands Acts. In the former instance the sheep are kept on purchased estates, on freehold or leasehold farms, together with a considerable area of country held under miscellaneous leases from the Crown for farming and grazing, or both pursuits combined.

In 1890 the number of sheep was 6,386,617. In the following year they had increased to 7,004,642, or by 9·7 per cent. In 1892 they further increased to 7,646,239, or 9·2 per cent.; but next year, 1893, the number receded to 7,152,047, or 6·5 per cent.

During the three years following, and in which interval no statistics were taken, we find that the flocks decreased by 828,954, or 11·2 per cent., the number returned in 1893 being 6,323,993 only. In 1898 they were further reduced in number to 5,032,541, a loss of 1,291,452, or one-fourth. In 1899 the trouble seems to have received a decided check, as, although there was no increase, the total is nearly the same, 5,012,620, or but 0 38 per cent. less.

Upon pastoral lands outside counties only 1,009,805 sheep are now kept, against 1,646,070 ten years since, and 2,090,045 in the year 1892, the highest number recorded, showing a loss of over one-half. Within the boundaries of the several counties where sheep are mainly run on freehold estates or on farms or grazing leases the losses have not been nearly as great, the flocks numbering 4,002,815, as compared with 4,740,547 ten years ago and 5,556,194 in 1892—the greatest number—showing a loss of 28 per cent. since that date. The addition within counties during the preceding ten years was 17 per cent., so it will take several ordinary if not good seasons to restore the numerical strength of the flocks.

It is satisfactory to note with regard to flocks kept by farmers and graziers in the settled districts that as against the loss of 21·17 per cent. (1,074,405) there is instead an increase, however small, of 2,302, or ·06 per cent. The Central division carried 872,715 against 886,935, or 14,220, or 1·60 per cent. less.; the Lower North, 978,926 against 960,308, an increase of 18,168, or 1·94 per cent.; the Upper North, 475,560, or 679 fewer; the South-East carried 1,334,500, a decrease of 19,462, or 1·44 per cent., probably owing to the great demand for fat sheep; and in the West there were 341,105, being 18,045, or 5·25 per cent., additional.

South Australian wool in 104,946 bales, containing 35,118,644lbs., and valued at £945,589, were exported in 1898. In the previous year 111,572 bales were shipped; contents, 36,683,239lbs., of £995,393 value. The decline in shipments was 6,626 bales, 1,564,595lbs. weight, and £49,804 in value.

The quantity of wool exported is generally taken to mean the produce of the clip, but as no account of the weight of wool on the sheepskins, now shipped in considerable numbers, is, recorded in the wool shipments, the aggregate production is so much understated. During the last ten years 133,886 packages of South Australian sheepskins, to the declared value of £1,541,336, were exported. The average shipment for the first five years was 11,612 packages, value £145,576, and 15,156 packages, value £162,692, during the last.

Twenty years since the number of pigs was 90,548, when, stimulated by the introduction of a valuable strain of Berkshire stock, pig-breeding assumed such proportions that in five years the number had increased to 161,907—then declined to 106,856 in 1889, and further to 60,132 in the present year. The imports of bacon and hams average 122 tons, mostly from Sydney, being in transit to Broken Hill in bond.

In connection with this industry attention may be drawn to the remarkable increase in the local salt production. For curing and domestic use this commodity, so excellent in quality, has excluded foreign imports. Ten years ago 1,597 tons were imported, at present only 183 tons. In 1889 the exports of South Australian salt amounted to 3,285 tons, in 1898 they reached 30,950 tons, of £38,492 value. Of this New South Wales took 17,068 tons, New Zealand 4,610 tons, Queensland 4,051 tons, and 3,556 tons went to Victoria. The total shipments for the ten years were 133,766 tons, of £166,267 value. This industry, chiefly carried on at the salt lakes on Yorke's Peninsula, is of great importance to the farming residents, who thereby find regular employment in the off season.

The number of goats is returned as 6,554, of which 2,322 are kept in the outlying pastoral districts, the remainder being distributed in small numbers in suburban localities. It is to be regretted that the fine flocks of Angora goats, the progeny of a few of pure breed introduced from the Cape many years since, and which had augmented to 802 in 1893, have become dispersed.

The number of stock other than those specified includes 772 camels, 886 donkeys, 216 mules, 703 ostriches, and 52 deer.

Few are aware of the large extent to which eggs are exported; the returns with regard to poultry are therefore of interest. Ten years ago the number of all kinds was 900,755, with an export of eggs of £37,899 value. In 1898 the number returned was 1,004,680, and the shipments were valued at £55,719, the total for the ten years being £381,003, or £108,728 more than the value of butter exported during the same period. During those years the supplies were distributed as follows:—New South Wales, £151,164; Western Australia, £134,535; and Victoria, £95,122; the trade for the last year being £45,299 to Western Australia, £9,925 to New South Wales, and £478 to Victoria.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.

3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with :—
   1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
   2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
   3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
   4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. Batchelor, Minister of Agriculture.

EXPORTS OF PRODUCE.

The following figures dealing with the export of staple products of South Australia are compiled from the monthly returns issued by the Customs Department :—

	Exports, December, 1899.		Exports, December, 1898.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Bark	369 tons	2,919	$349\frac{8}{20}$ tons	2,779
Bread and biscuits	2,018lbs.	43	6,056lbs.	123
Butter	123,404lbs.	5,337	194,821lbs.	7,017
Eggs	—	5,785	—	3,858
Fruit—Fresh	9,304.pkgs.	3,869	5,648bush.	3,019
Dried	3,416lbs.	66	3,062lbs.	61
Grain—Barley	213bush.	59	—	—
Bran	$613\frac{9}{20}$ tons	2,113	$367\frac{10}{20}$ tons	1,311
Flour	$5,212\frac{9}{20}$ tons	36,178	$2,388\frac{10}{20}$ tons	19,303
Oats	1,258 centals	314	241 centals	95
Pollard	$158\frac{18}{20}$ tons	527	$188\frac{19}{20}$ tons	680
Wheat	137,355bush.	17,314	64,827bush.	8,786
Gum	670cwts.	182	213cwts.	52
Hay and chaff	$989\frac{18}{20}$ tons	2,266	$1,497\frac{6}{20}$ tons	3,787
Honey	3,565lbs.	46	5,376lbs.	73
Jams and preserves	74,116lbs.	1,112	71,156lbs.	1,085
Leather	—	4,502	—	6,194
Meat—Mutton and lamb (frozen)	369,553lbs.	6,362	—	—
Preserved	32,416lbs.	361	58,260lbs.	899
Potatoes	1,405cwts.	476	2,278cwts.	1,085
Skins and hides	1,859pkgs.	26,911	861pkgs.	9,058
Tallow	$34\frac{18}{20}$ tons	685	$99\frac{8}{20}$ tons	1,800
Wine	39,092galls.	6,937	46,042galls.	6,307
Wool—Greasy	5,049,810lbs.	207,730	6,357,727lbs.	168,281
Washed	428,893lbs.	33,883	652,105lbs.	30,828

The exports of a few of the leading lines for the past four years compare as follows:—

		1899.	1898.	1897.	1896.
Bark	tons	8,930	8,205	5,704	7,331
Butter	lbs.	1,402,261	769,363	166,213	605,301
Flour	tons	50,070	22,748	17,327	51,115
Hay and chaff	tons	10,695	8,913	4,177	33,205
Honey	lbs.	100,430	60,512	139,125	140,662
Preserved meat	lbs.	1,274,801	1,165,890	1,530,592	1,056,072
Wheat	bush.	3,114,781	9,073	9,282	455,942
Wine	galls.	496,510	514,065	513,714	391,233
Wool	bales	111,450	104,946	111,572	140,895

WHEAT-GROWING IN AMERICA.

The fact that several of the individual states of America produce more wheat than the whole of Australasia, and that one alone produces more than twice as much, will come as a surprise to many of our readers. In round numbers the world's production of wheat in 1898 amounted to 2,879,924,000bush., of which Europe produced more than one-half, America one-fourth, and Asia about one-seventh. Africa produced about 44,000,000bush., about one-fourth more than Australia. The United States heads the list of wheat-producing countries with 675,000,000bush., Russia being next with 403,000,000bush., France 360,000,000bush., and India 256,000,000bush.

Of the American states Minnesota is the largest producer, having in 1898 5,000,000 acres under crop, yielding 78,000,000bush.—more than twice the Australasian production. The two Dakota states yielded between them about 120,000,000bush. The wheat is brought by train, road, or boat to the great wheat centres, and much is stored in great wheat elevators, some of which hold 2,500,000bush. The wheat is carried to these centres in bulk for the most part, and the machinery at some of the elevators is capable of unloading a cargo of 180,000bush. in a few hours, and reloading it into cars or canal boats by means of five or six different shoots in very much less time. Some of the largest lake boats, built specially for the purpose, can carry 250,000bush. in one trip. Most of the wheat from the north-western districts goes by lake and canal to Buffalo, thence by cars to the coast, and thence to Europe. Business is done on such a large scale, and is handled so economically from start to finish, that it is stated on good authority that the cost of transport from Minneapolis to Europe, including three transhipments, is under 10d. per bushel. The United States' exports of wheat or wheat products represented about 200,000,000bush., more than half of which goes to Great Britain, the annual value of that portion being nearly £24,000,000.

At the principal wheat centre, Minneapolis, the wheat is graded by inspectors under State supervision. In 1898 upwards of 75,000,000bush. were handled here, and were graded into eighteen different grades, the top grade being the much-talked-of No. 1 Hard Spring wheat. Complete records and samples of every carload of wheat are kept by the State for reference in case of dispute as to quality of any of the shipments graded by the inspectors, a small fee being charged for the work of inspection and grading.

In regard to the cost of producing the grain, the Wisconsin Bureau of Industrial Statistics states that as a result of over 7,000 answers and schedules from growers, covering a period of three years, the average cost to the farmer, including interest, deteriorations of buildings and machinery, and every other expense attached to the production of the crop, is as nearly as possible 2s. 3d. (54 cents.) per bushel, while during the past six years the returns have averaged 2s. 6½d., without taking into consideration the value of the by-products. In 1898 the average crop for the United States was 15·3bush.; in 1895, 13·7bush.; in 1891, only 11·1bush., showing that the returns are gradually being improved. It would be interesting to have, for comparison, estimates of the cost of producing a bushel of wheat in the various districts in South Australia with a crop of 10bush. or over.

BINDING DRIFT SAND.

The trouble with drifting sand has been very acute during the past year or two, especially in inland districts. This is doubtless largely due to the dry seasons experienced and the prevalence of strong winds from one direction. The main cause of the trouble is, however, the destruction of the vegetation natural to sandy lands.

Attempts have been made in various parts of the colony to moderate the trouble, and where a reasonable system has been adopted, success has rewarded the efforts of the landowners. Amongst those on the sea-coast may be mentioned the reclamation by planting Marrem grass, at Normanville, by Messrs. Butterworth & Macmillan; at the Corney Point Lighthouse reserve, by the authorities; and at Robe and other parts of the southern coast. The problem of dealing with inland drift sands has been attacked by the district council at Meningie, as well as by a number of private individuals in different parts, and a few suggestions as to methods of dealing with the trouble may be of value to those engaged in the work.

In the first case, care should be taken to prevent further drift. This can best be done by preserving as far as possible the natural vegetation, and planting on spots showing a tendency to drift some of the proved sand-binding plants. Too close stocking must be avoided, and where attempts are made to reclaim drifts it is absolutely essential that stock should be kept off the scene of operations for a year or two.

In dealing with sea-coast land there is no better plant than the Marrem grass. This is a very tough grass, growing in bunches to a height of 2ft. to 5ft., with creeping underground roots which sometimes extend for 30ft or more from the parent plant, throwing up fresh growths from the points. As the plants get covered by sand new roots are thrown out from the nodes, thus providing a constant succession of growth on the top of the drift, and gradually building it up. It has been found that this is essential to the vigorous growth of the plant, and where for any reason the sands no longer shift the plants become weakly. Otherwise the grass is practically indestructible. Sea Lyme grass (Elymus arenarius) is second only to Marrem grass as a sand binder, and resembles the latter very much in its growth, though perhaps not so vigorous. This plant is found on parts of the southern coast, and is of great value. Both plants can be propagated by division of the roots, or from seeds. Where roots are obtainable they are best, though of course more expensive. They are planted 9in. to 18in. deep, according to character of the drift, at about 2ft. apart. They soon increase in size, and form a dense mass of growth, which holds the sand that may drift up from the windward side. Seeds must be covered with brush or other material to prevent them being blown away or covered too deeply. Roots should be planted in the autumn, as the plants are in better condition to make growth before the summer sets in. Where the slopes are steep, and large hollows exist, through which the sand is carried, brush and scrub should be placed at the windward side to break the wind and arrest the sand. The indigenous mat grass (Spinifex hirsutus) is one of the most valuable binders of sea-coast sands. Seeds of these and other grasses, shrubs, and trees that are known to grow in sand should be scattered in the brush in order to secure vegetative growth on the sand as it consolidates. Clippings from the African Boxthorn are useful for this purpose. When the land has been partially reclaimed seeds or young plants of such trees as the Sheaoak, Maritime Pine, the so-called Native Myrtle (Myoporum), Acacias, Tamarix, &c., should be tried. Any fallen timber should be allowed to remain as protection to grasses and small plants that would otherwise be destroyed. Couch grass could also be planted with success, and provides a fair amount of feed for stock when once established. Marrem and Lyme grass do not provide feed, except when the young growth is making headway. Amongst grasses which make feed for stock, and are valuable as sand binders, are Seaside Oats (Uniola paniculata), a tall ornamental perennial with handsome flower heads; Creeping Panic grass (Panicum repens), growing 1ft. to 2ft. high, with creeping rootstocks; Switch grass (Panicum virgatum), though not so valuable as a sand binder, grows to 3ft. or 4ft., and is regarded as of more value as a fodder. Seaside Bluegrass (Panicum macrantha) is a smaller grower, with leafy stems, an excellent sand binder and good for grazing; Buffalo grass (Stenotaphrum americanum) is another grass that will do well close to the coast, but, it is stated, is not much liked by stock, and does not stand feeding like couch grass.

In dealing with inland sand drift a great deal will depend upon the configuration of the land and the character of the soil. There are considerable areas where the sand will sustain fodder-producing grasses that will not do on the coast, and on such the hardy strong-growing grasses of no forage value should not be used. Where the drift can be easily worked with a plough probably the best way to commence work is to sow rye early in autumn and plough it under. This will come up with the first rain and make fair growth. Stock should be kept off, and the plant allowed to remain. The plants, even when dead, will prevent the sand from drifting in ordinary seasons, and, if untouched, will re-seed the land. In the meantime the natural herbage will have a chance to grow, and seeds of sand binders of forage value can be sown either with the rye or in the stubble. Couch grass will do well on this class of land, and provides a fair amount of feed. Once established it will stand a large amount of stocking. Seed can be sown with the rye, though probably a quicker way, and cheaper in the long run where carriage is not too expensive, would be to get the plant in turfs and set them in rows about 15in. to 18in. apart. The turfs can be obtained from the roadsides at several seaside towns for merely the cost of collecting them: in fact, some corporations are put to considerable expense in keeping the grass cut away from the drains, &c. Where the drifts are of a hilly character a different method will need to be adopted. The sides most exposed must be protected with brush or rubbish of some description to hold the sand while whatever is planted is growing. Such drifts are far more difficult to deal with than others, and can only be reclaimed at considerable expense. Marrem grass will grow inland, though perhaps not so strongly as on the coast. Lupins have been successful in many parts of the world, and saltbushes will also do well, but in rabbit-infested country there is an objection to plants forming dense bunches or bush, owing to the harbor afforded to the rabbits. There is no doubt that in such districts couch grass, buffalo grass, Johnson grass, Hungarian Brome grass, and others of a similar character will be best, the first-mentioned being of more general utility than any of the others. Other grasses, mentioned as being good binders and also fodders, may be mentioned—Yellow Lyme grass (Elymus flavescens), Poa eckenbyi, Muhlenbergia pungens, and some of the Brome grasses. Two splendid plants for inland sand—Redfieldia flexuosa and Calamovilfa longifolia

—are mentioned as being of no value for feeding purposes, consequently should not be used if the desired result can be obtained with the other plants.

When planting either seeds or plants for reclamation purposes it is better to do the work early in the autumn, as most of the drift occurs in the summer months, and it is essential that whatever is planted should be given every opportunity to obtain a hold before the dry weather sets in. Many of the plants referred to in the foregoing are recommended in the Year Book of the U.S.A. Department of Agriculture.

The following account by the Superintendent of the Golden Gate Park, San Francisco, of the methods adopted to cover the barren sand dunes with vegetation will be of interest:—"About 700 of the 1,040 acres composing the reservation were originally acres of drifting sand that moved with every storm, heavy gales sometimes moving it to a depth of 3ft. in twenty-four hours. This sand is sharp and clean, with nothing in its composition of a loamy nature, barren and poor, so poor that barley sown on its surface, after being ploughed and cultivated in a favorable season with plenty of moisture, grew only about 6in. in height, and failed to perfect its seed, although perfectly protected from winds by a high embankment on its western side. The first operation necessary in the reclamation of ground of this sterile nature was to bind the sand to prevent its moving. Experiments were made by sowing barley, also by sowing seeds of the blue and yellow shrub lupin, Lupinus arborea, also by planting seeds of Pinus maritima, all of which were partially successful; but the first complete success was with the planting of the entire area with the sea bent grass (Calamagrostis arenaria), which was done by planting the roots about 3ft. apart, and run in with a plough. A furrow was run about 15in. deep, in which a few roots were dropped, about 3ft. apart; then two furrows were turned, in which no roots were set; in the third furrow roots were again planted, and so on over the entire tract. Where the dunes were too steep for horses to travel, pits were dug by hand and the roots planted the same distance apart as when the land was ploughed, care being taken to firmly press with the foot the sand immediately about the roots. Moist, or even wet weather is, of course, the best time to plant this grass, the best season for planting being between December 1st and February 15th. If planting be delayed much longer, dry weather is apt to set in before the plants become firmly rooted, and the consequence is many are lost either by drought or by being blown out by the winds. Where any large areas of plants were blown out by the roots, care was taken to have the ground immediately replanted, a gang of men being sent after every storm to pick up the scattered roots and to plant them deeper, if possible, than before. The entire tract being planted with this grass, the next operation was the building of brush fences across the wind about 100yds. apart and from 4ft. to 6ft. in height, on the sheltered side of which young seedling trees were planted, averaging 5ft. apart. A variety of trees were experimented with, among which were the Norway maple, which is so highly recommended in European works of reclamation; the tamarix, and the poplar, the Monterey cypress, the Pinus insignis, Pinus maritima, Acacia lophantha, Acacia latifolia, and the Eucalyptus viminalis, globulus, &c. All these made satisfactory progress excepting the Norway maple and poplar, the summer winds blowing off every leaf almost as soon as formed. The Acacia latifolia and Acacia lophantha, the Monterey pine, Monterey cypress, and the tamarix are about equally adapted for standing exposed sea winds, and all seem to thrive equally well in the sand; but we find that the barren sand does not contain nutriment sufficient to grow trees more than 10ft. in height, or until the tree begins to form heart wood. About that stage of growth the tree begins to show signs of distress, the leaves of the conifers gradually grow shorter, the bark gets bound, and the whole tree shows a stunted, starved look. Acres and acres are now in that state, and, unless given assistance, will die outright. Several years ago the work of fertilising the forest trees was begun, and wherever a load of loam, manure or other rich dressing was spread, the hungry tree responded very quickly by making good growth, a more thrifty look was noticed, and in less than a year they had a vigorous, healthy look, showing that want of nourishment alone was the cause of their stunted appearance."

OBSERVATIONS ON THE DENUDATION OF VEGETATION.

By Marsdon Manson, C.E., Ph.D. (in *Sierra Club Bulletin, U.S.A.).*

When man, actuated by greed or ignorance, or a combination of the two, destroys the protection which nature spreads over rolling and mountain areas, he turns loose agencies which soon pass beyond his control. The protecting agent is vegetation, and whether in the form of forests, brush, or forage plants and grasses, the balance between it and denuding forests is easily tipped, and then the inexorable law of gravity (unchecked by myriad blades of grass, by leaves, roots, and vegetable moulds), gullies the hillside, strips the mountain slope, converts the rivulet into the torrent, and causes the steady flow of the river to become alternately a devastating flood or a parched sand bed. When once this balance has been destroyed man cannot turn back the torrent and bid it flow once more a living and life-giving stream.

It would seem that this lesson had been learned so thoroughly by the human race that there would be little use to lay its precepts before a civilised community. But when one goes out and marks the rate at which forests are being destroyed, mountain forage areas devastated, he is tempted to regret that civilisation should be permitted to spread its blight over the temples in which the savage worshipped.

But it must be remembered that this destruction ceases in the judicious use of this wealth of forest and of mountain pasture, and that it is only indifference and incivism which permit greed and ignorance to go unrestrained until they destroy the balance—that man has it within his power to utilise to its fullest measure this wealth, and to pass it down to future generations as a blessing, rather than as a blight and a curse—and that he can even aid nature by extending vegetation over barren areas. But this requires that the reckless destruction of forests and the wasteful and continuous devastation of pasture should be replaced by systematic utilisation of these sources of wealth.

Effects of Denudation.—Probably no range of mountains has longer had civilised man around its base than the great Caucasus and its outliers. This range extends from the Straits of Kertch to the Caspian Sea, a distance of over 900 miles. The culminating peak, Mount Elbruz, rises some 3,000ft. higher than the highest peaks in the United States, and the group is analagous to, but greater in all respects than, the Sierra Nevada. Its slopes drain either into the Caspian Sea or into the Black Sea and the Sea of Azov. The slope draining into the Black Sea is subject to summer rains, and therefore more readily recovers from denuding agencies. The southern slope is broader and gentler than the northern, which is subject to a drier climate, and sparsely covered with both deciduous and coniferous growth. At all points where these mountains were observed man has wrought ruin since the dawn of history. Every stream, every slope, is marked with destruction. The great historic route up the Tirek, through the Darial Pass, and down the Gudoor and Arangua to the plains of Asia Minor, is everywhere seamed with the ruin which the unrestrained hand of man has put in force, In passing along the main drainage lines it is possible, with a little experience, to determine the comparative exposure of the tributary watersheds by the amounts of *debris* brought down. Measures have been taken to restrain and divert the flow of *debris* from the roads, and to provide crossings where roads are buried and bridges swept out, but nothing which man can call to his aid can restore soil to these wasted slopes. Such is the penalty of unrestrained stripping of timber and forage plants.

In parts of Europe the destruction has been as great. The literature on this subject is both voluminous and accessible. Enormous efforts have been put forth by the European governments to check the destructive force of torrents borne upon the denuded slopes of the great chains of mountains throughout the continent. In no instance have these efforts been adequate, although much has been accomplished. Of the deserts of southern France, S. Baring-Gould writes that "one hundred years have sufficed to sweep every particle of soil from the Causses, which it took countless ages to accumulate; and land that once maintained a well-to-do population is reduced to a desert.",

The plateaux of central Spain and the south slope of the Pyrenees afford the best comparisons with the conditions of California—the climate and rainfall being in general analogous, and the poverty and desert-like conditions warn us as to our future should our present course of timber destruction and unrestrained pasturage continue. The descendants of the shepherds who devastated the fair land of Isabella are, in many instances, found at the same work in Californian mountain pastures, equally disregarding the laws of nature.

In the Rocky Mountains, the work of devastation has been inaugurated on a scale calculated to dwarf anything done in Europe. Forest fires, the crowding of vast herds of sheep, the axe of the lumberman—followed by the fires of the sheep-herder—have all been active agents in converting vast areas into deserts as barren as those of the Causses, the Atlas, or the Apennines. In portions of the Rocky Mountains trees spring up rapidly after the first forest fires. Even when these fires have been so fierce as to absolutely destroy every vestige of timber, a second forest springs up with remarkable promptness and vigor ; but when this is destroyed the next attempt to restore vegetation is slower and not effective. In some places the land has become in a space of two years absolutely barren. Such areas had been twice swept by forest fires—the first burning off the original timber; the second, following a few years later, killing the sapling firs and pines. Although two summers had elapsed, not a sprig of vegetation had started to clothe, for the third time, the naked rocky "backbone of our continent."

The Sierra Nevada has fared even worse. Around Lake Tahoe the timbered areas have been entirely swept off, with the exception of a few thousand acres around Tallac, and some at the north end, reserved by the owners for later use. The mountain sides around the Hot Springs, and nearly all of the moraines and flats around the south and east sides of the lake, have been denuded. These areas, bereft of timber, are now ready to be abandoned to the State, large tracts being for sale at 50 cents. per acre. The railroads, which were constructed to carry logs to the lake, have been torn up. and the region, shorn of its wealth and beauty, has been partly browsed over to give a few sprouts to hungry hordes of sheep.

On the forks of Carson River there are several townships from which every vestige of timber has been stripped—first for mine timbers and later for wood. Then the area was burned over to afford tender shoots for spring pasturage. To-day it is only in rare little patches that young conifers are beginning to gain a foothold, and fires destroy many of these plantations. On the east fork in 1896, after heavy summer showers, the water sluiced off the ashes and soil to such an extent that tons of trout were killed. After the torrent subsided one could drive a four-horse wagon along the banks and fill it with trout. It is doubtful whether the stream can be restocked until the denuded slopes shall be afforested.

Prevalence of Forest Fires.—It is only necessary to read the accounts given in the daily press to partly measure the destruction by forest fires. The writer has personally traced these through every mountain county in the State. Even of that area which has been sacredly set aside as the Yosemite reservation, the threat was openly made by the maurading sheep-herders, who had devastated Spain and Portugal, that they "would burn the Government out"—referring to the cavalry sent up to prevent the illegal destruction of the vegetation protecting the head-waters of the Merced and Tuolumne. The overstocking of these mountain pastures is what is doing the greatest harm. The writer once asked an intelligant stockman how many sheep could be pastured on a given area in the Sierras, and he gave as his opinion that 8,000 sheep could be pastured thereon without injury—that is, without destroying all seed of forage plants and grasses. But, upon naming over the owners and herds which he knew, there were 40,000 sheep accounted for in the area.

In other parts can be seen where, as a result of a so-called "cloud-burst," nothing more than a heavy summer rain upon a burned-over district, concentrating rapidly in the steep gulches, the timber, boulders, and earth have been completely scoured away.

Cloud-bursts.—In travelling thousands of miles in various ranges of mountains on three continents the writer has never seen the track of a cloud-burst in a timbered country—always in the barren ranges from which timber was either naturally absent or had been destroyed by human agency. The reasons for this are twofold:

First—Heavy rainfall occurring in a well-timbered country is absorbed, even when the fall amounts to several inches in a short space of time. In a barren region this absorption does not take place; the rain rapidly collects in gulches, and forms—in some instances—a veritable wall of water, soil, gravel and rocks, carrying everything before it.

Second—The layers of cold, dry air, and hot, moist air, can superimpose themselves in a treeless country in such a manner that when condensation is inaugurated it takes place with destructive violence. These conditions are modified, or even entirely prevented, by the effects of forests and vegetation; and hence those regions escape the most violent downpours. The rainfall in tropical regions is several times greater than any occurring upon the treeless regions subject to "cloud-bursts"; yet the destructive run-off from tropical forest areas does not occur, on account of the dense forests and undergrowth.

The Coast Range in Lake county presents some of the worst of the early stages of denudation. The herding of sheep has been so close and continuous that the forage plants and grasses have nearly disappeared. Over large areas it is now difficult, if not impossible, to find a single specimen of a once abundant forage flora. Many acres of valley land are being washed away; the beds of streams are widening by cutting away alluvial deposits of past ages and leaving bars of cobbles and gravel in their stead. These evidences of rapid deterioration are characteristic of all the public and much of the private land in the country. This is the price which has been paid for the reckless use of the wealth with which that country was endowed; and the little benefit gained has accrued, in many instances, to herders or owners of sheep who owned no part of the lands upon which the damage is being inflicted. This country has been abused to such an extent that it is doubtful whether all the wealth which has been made upon wool and mutton in the entire State since 1849 could restore this single county to its pristine condition. Nor is this state of affairs confined to Lake county—it extends throughout the State. If unheeded for a generation more it will not be within the power of the human race to stay the destructive forces which have thus been turned loose, and to restore to our mountains their reservoirs of wealth and of water. Yet, under systematic and intelligent control, these areas may still be made the sources of perennial and increasing wealth, and the reservoirs from which the mining and agricultural lands below may draw never-failing supplies of water.

In Santa Clara county the floods of Los Gatos Creek have measurably increased in destructiveness. In one of the richest portions of the valley more than $1,000,000 worth of land has been recently destroyed. The feeble efforts of the adjacent land-owners to stay the force of the torrential floods which, with increasing volumes, are eating away the alluvial lands, leaving in their stead the "barranca" forms of Southern and Lower California, are powerless to stem the destruction.

In Southern California.—In the lower reaches of the Santa Ana many hundreds of acres of valuable soil are being buried under wastes of sand brought down from the burned-over sheep pastures of the mountain water-shed. These instances could be multiplied almost indefinitely from every portion of the State, but the real damage has so far only commenced. The most appalling feature is the absolute indifference with which the mass of the people and the lawmakers of our country regard the ultimate consequences of the forces at work.

Effect of Vegetation in Storing Water.—But few give full credit and consideration to the effect which vegetation has in checking the rate of run-off and aiding in the storage of water. This effect is vital, both to the preservation of springs and streams and to artesian supply, and preserves and supplements artificial storage.

In a catchment area of 500 acres to one acre of reservoir space below each foot of depth of reservoir capacity is equalled by an effective storage capacity of soil of less than $\frac{1}{40}$in., so that if by reason of that covering the catchment area with vegetation, $\frac{1}{40}$in. of rainfall can be caught beneath the surface and let down slowly to dependent springs and streams, this fraction is the equivalent of an acre covered 1ft. deep; or 1in. of moisture stored in the soil is equivalent to 40ft. of water in the reservoir.

In many forests in California it takes more than 5in. of rainfall in the autumn to give an appreciable increase of run-off—showing that the forest has checked the rate of run-off to an extent more than 200 times greater than the figure above mentioned as being the equivalent of a foot of water in the reservoir.

The great difference in the storage capacity of a timbered and non-timbered area is plainly shown in the flood capacity of the channels draining each. In the northern coast counties, subject to an annual rainfall of from 50in. to 60in., the flood channels are of far less capacity than those in the southern coast counties, upon which the annual rainfall is from one-fourth to one-fifth that in the northern mountain slopes. The run-off from the timbered areas is so slow that it is not accomplished in months.

In considering the problems connected with the storage and conservation of water it is essential to take up that of the storage or sponge capacity of the soil, and the means necessary to increase this. Whether reservoir space be available or not, this factor and its possible increase should not be neglected, for a reservoir supplied from a catchment area devoid of protecting vegetation is soon silted up.

To directly trace and determine the effect of an increased rate of run-off upon artesian supply is a difficult and obscure problem. But the broad results are clear. Whether the water seeps into and through permeable strata, or under the edges of impermeable clays along the upper reaches of the valley channels, the result is the same. If the catchment area be denuded of vegetation and soil, a decrease in artesian supply must follow. This is due to the shorter time in which the rainfall can seep into the water bearing strata—the increased rate of run-off going to swell the volume and destructiveness of floods.

Present Area of Californian Forest Reserves.—In order to bring these generalisations into practical bearing upon the problems which confront us in California, we will consider the areas set aside as forest reservations and remaining as public domain in California.

Forest reserves approximate 14,000 square miles, as follows:—

	Acres.
Stanislaus forest reserve	705,000
Yosemite forest reserve	1,009,680
Sierra forest reserve	4,079,360
Pine Mountain and Zaca Lake forest reserve	1,159,083
San Gabriel forest reserve	573,048
San Bernardino forest reserve	731,176
San Jacinto forest reserve	664,678
Trabuca Canyon forest reserve	49,760
	8,971,785

In addition to this, 34,688,932 acres, 54,000 square miles, or about one-third the area of the State, is yet public land. These two aggregate 68,000 square miles, much of which is classified as desert land, but even this is used many months of each year for pasturage; another large fraction is mountain or rolling land, sparsely timbered or covered with brush, interspersed with forage plants, which make it of great value for pasture.

Management of Reserves.—The policy of the Government in the control of this vast area has been along one of two lines—absolute neglect or absolute exclusion. After long periods of neglect, spasmodic efforts at protection have been made by sending out a "special agent" from the "East," who generally knows but little of our forests and less of our climatic conditions. Sometimes his efforts have resulted in the institution of suits for "illegal cutting of timber." These have generally resulted in dismissal, or, in rare instances, in the rendering of a judgment amounting to a small percentage of the value of the timber stolen. In some instances, when active and real examinations into the illegal seizing of lands, cutting of timber, or other abuses have been instituted the agent has been recalled.

These efforts have, therefore, never resulted in much good other than to check for a while the fraudulent acquisition of public land, or the stealing of timber therefrom. They have never been the result of a well conceived and sustained effort to protect the public domain, and to conserve the interests and wealth thereof.

In one or two of the reservations the policy of absolute exclusion has been spasmodically carried out; a force of cavalry has been sent up to patrol the reservations, and under the thorough discipline of army officers trespassing sheep-herders have been arrested, their flocks scattered, and effective restraint inaugurated over a limited portion of the forest areas.

Neither of these policies is wise. The first condemns itself; the second fails to utilise the vast wealth of forest and pasture which these lands are capable of yielding. It is doubtful whether any system of forest managment controlled from Washington, and under an ever-changing political system, could be efficiently and wisely administered. There are great obstacles to be overcome in getting rational conception of the facts before Congress. Eastern members, and even our own, rarely having more than a general idea of the facts, are adverse to any policy of "withdrawal of the public domain from market" as long as there is land of speculative value left.

Again, the climatic conditions of California differ widely from those of other portions of the United States, and present greater difficulties to forest cultivation by reason of the absence of summer rains. Our forest flora are unique in the world; hence forest management here must be essentially modified from that found advisable elsewhere. It would, therefore, require a local and unique treatment, special in its development, and entirely different from what we must expect from a Government which has never undertaken the handling of forest areas in a wise and statesmanlike manner.

Timber Lands Sold Too Cheap.—The valuable timbered areas have long since passed to the ownership of aggregations of capital or private parties. In the Coast Range it sometimes happens that 1,000,000ft., board measure, of lumber stand upon a single acre; this, at a stumpage of $2·50 per 1,000ft., is worth $2,500, yet it has been sold for $2·50. The sugar pine, redwood, fir, spruce, etc., of the Sierras have been disposed of in the same way. This is not new in the history of this country. The white pine of Maine, the live oaks of Florida, the vast pine forests of Michigan and Washington received the same treatment, and to-day thousands of acres, despoiled of their recuperative powers, checked by destructive pasturage and intentional or accidental fires, are in one or the other stage of decrepitude. The owners of these lands are, in some instances, almost ready to return them to the State. When an attempt is made to check the evil of timber-land grabbing pressure is brought to bear on Congress by those who desire to exploit the public wealth, and the attempt is rendered abortive. The results of this system are glaringly set forth in the case of the live oak forests of Florida. Shortly after Florida was purchased large reservations of this valuable timber were made for the use of the navy. Later, contractors for furnishing this class of timber to the navy supplied, at high prices, the timber stolen from these very reserves.

Reforms Necessary.—Nevertheless, under the advice and spur of those interested in forestry, and who realise the evils of forest denudation, broad and important investigations have been made, thorough studies have been carried on, the benefits to follow from correcting the evils which are practised are fully elucidated, and have been reiterated with convincing force before successive Congresses for the last quarter of a century or more ; yet no broadly-conceived policy to check forest fires, to stop depredations, nor to afforest barren areas has been put in force ; nor has any considerable portion of the funds recovered from timber stolen from the public domain been used to afforest the same; neither is any part of the funds derived from the sale of timbered lands set apart for forest preservation. No broader studies have been made under any Government than the advocates of forestry have issued from the Government Printing Office. That these studies have resulted in no practical result is proof of the view that Congress cannot directly manage practical forestry.

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The Remedy suggested for California.—The writer therefore advocates that all forest reservations and public lands upon mountain slopes, within the borders of the State, be granted by Act of Congress to the University of California in trust; that the object of this trust be to protect, maintain, develop, and extend the water supply of these areas for ever. For this purpose the regents be empowered to lease, under proper control, the timber-cutting and pasturage privileges of these areas, and to use this fund—

1st. To protect the catchment areas.
2nd. To maintain a college of practical forestry.
3rd. To construct reservoirs at such points as may be necessary to the industries of the State, and dispose of the water for the benefit of the trust.
4th. To acquire mountain lands to be added to the catchment areas.
5th. To do all such things as may maintain wise systems of forest and water conservation and use.

Since the Government has sold the timbered areas and permitted them to be stripped to the serious injury of our water supply, it may justly be claimed that the best restitution it can make is to set aside the remaining lands for the purpose of restoring and conserving this water-supply.

Forest Revenue.—The extent of income-bearing property which can be made available for forest preservation and storage of flood waters is far beyond the general idea. It has been shown that the public lands and reservations within the borders of the State of California are about 68,000 square miles. It would be difficult to determine the value of the pasturage and timber-cutting privileges of this area. The fact that it covers more than one-third of the area of the State, and that upon it a large portion of the stock raised in this State and in the adjoining State of Nevada is annually pastured, is proof that it is of considerable moment. Although public domain, it is used for private purposes in a way that is surely accomplishing a ruin of which we have but an inadequate knowledge. An experienced stockman placed the value of the pasturage privileges of the Yosemite Reservation at $50,000 for the summer of 1898, and at more than half that sum for ordinary years.

Inyo and Mono counties draw a revenue of from $3,000 to $7,000 per year from a "sheep licence," which they levy on itinerant herders who pasture sheep on the public land in those counties.

The Yosemite Reservation is about one forty-fifth of the public land and forest reserve areas, and on the above valuations is estimated to be worth at least $25,000 per year for pasturage alone. This probably measures a considerable fraction of the value of the entire area. If this fraction be placed at one-tenth the gross value of these privileges, it represents a revenue of a quarter of a million dollars per year, or 4 per cent. income on $6,250,000.

Present Devastation.—It must be borne in mind that this area is now being used by individuals in such a way as not only to devastate it, but to seriously damage the fertile valley lands below the mountain areas and to threaten cities and farming communities with ever-increasing floods, with the resulting low-water stages of spring and summer. If this policy be continued it will reduce California to the conditions now prevailing in corresponding latitudes in Spain, Italy, northern Africa and Asia Minor. The same forces, the same methods, which have stricken those countries with poverty and degradation are to-day being wantonly and recklessly put in force here. The people of those lands are even now finding congenial employment upon our mountain slopes and are inaugurating the same practices which have reduced the orchards, vineyards, and pastures of their forefathers to uninhabitable wastes.

Thus these vast areas are becoming more and more barren and less and less able to restrain floods, instead of being systematically improved with the ever-increasing revenues which they can be made to yield.

Mining and agricultural interests are now confronted with the necessity of organising to secure State and Government aid to construct reservoirs, to store flood waters for use during the late summer and autumn, the increasing rate of run-off not leaving sufficient water in the streams to serve their needs. Even if these efforts were at once successful, the construction of reservoirs will not answer future needs. Without forest preservation, these reservoirs will fill up with sand, gravel, and cobble-stones. Thus these reservoirs, if built, will answer the needs of only the immediate future.

The Object in View.—The only true solution of the question is to utilise the revenues which the pasturage and timber-cutting privileges of the public domain can be made to yield in protecting the watersheds from denudation, and in conserving and storing the water supply. Could these revenues be justly expended for this purpose, the areas would be ever increasing in value and usefulness, and nothing need be asked from the State or from the Government save a sum sufficient to inaugurate the work. If any better, any broader plan be offered, the writer will bend every energy to put it in force. There are, of course, interests now thriving on the free use of these areas which, for selfish reasons, will oppose any measure looking to stay the destruction by which they profit. Yet if our civilisation is to stand—if this great commonwealth is to advance with the advancing ages—this devastation must cease ; systematic and economic use of this wealth must take the place of the methods now in vogue. History and nature record no law more inflexible—no effect more certain—than that poverty and degradation follow upon the destruction of mountain forests.

EXPERIMENTAL MANURING.

REPORT BY MR. A. N. PEARSON, CHEMIST, DEPARTMENT OF AGRICULTURE, VICTORIA.

Wheat on Fallow Land at Mr. Telford's, Mount Pleasant, near St. Arnaud. Sown, April 21 ; *reaped, December* 20, 1899.

	Yield per Plot.	Bushels per Acre, at 61½lbs. per Bushel.	Corrected for Loss, owing to Wind and Stripper.	Bushels per Acre Gained by Manure.	Value of Increase, at 2s. per Bushel.	Cost of Manure per Acre.	Excess or Defect of Value of Increase Above or Below Cost of Manure.
a b	c	d	e	f	g	h	i
	lbs.				s. d.	s. d.	s. d.
Border plot	29	11·79	12·73				
Plot 1—10lbs. concentrated superphosphate	37½	15·24	16·46	3·84	7 9½	1 1½	6 8 Excess
Plot 2—No manure.	28½	11·63	12·51				
Plot 3—20lbs. concentrated superphosphate	41½	16·87	18·22	6·00	12 0	2 3	9 9 Excess
Plot 4—30lbs. concentrated superphosphate	41½	16·87	18·22	6·29	12 7	3 4½	9 2½ Excess
Plot 5—No manure	26½	10·77	11·63				
Plot 6—26lbs. ordinary superphosphate	35½	14·43	15·58	3·58	7 2	1 2	6 0 Excess
Plot 7—26lbs. Thomas phosphate	31½	12·81	13·84	1·47	2 11	1 2	1 9 Excess
Plot 8—No manure..	29	11·79	12·73				
Plot 9—10lbs. concentrated superphosphate, 20lbs. nitrate of soda.	31½	12·81	13·84	1·33	2 8	2 11	0 3 Defect
Plot 10—10lbs. concentrated superphosphate, 40lbs. nitrate of soda.... ..	30½	12·40	13·39	1·00	2 2½	4 8½	2 6 Defect
Plot 11—No manure	27½	11·18	12·08				
Plot 12—15lbs. concentrated superphosphate, 60lbs. nitrate of soda	32½	13·21	14·27	2·49	5 0	7 0¾	2 0¾ Defect
Plot 13—15lbs. concentrated superphosphate, 46lbs. sulphate of ammonia	31½	12·81	13·84	2·36	4 8½	6 4¼	1 8½ Defect
Plot 14—No manure	25½	10·37	11·19				
Plot 15—39lbs. Thomas phosphate, 60lbs. nitrate of soda	32½	13·21	14·27	2·53	5 0¼	6 5½	1 1¼ Defect
Border plot—No manure	28	10·38	12·29				

The plots, which were 9ft. wide and 193½ft. long, or 1-25th acre in area, were sown on fallow land on the 25th April and harvested about the 20th December, 1899. The manure was put into plots 1, 3, and 4 by drill, but an accident happening to the drill at the commencement of the fifth plot, all subsequent plots had to receive both the manure and the seed broadcast. Notwithstanding this it will be seen that plot 6, which received the same amount of phosphoric acid in the form of ordinary superphosphate as plot 1 had received in the form of concentrated superphosphate, produced very nearly the same increase, namely, 3·58bush. per acre on plot 6 and 3·84bush. on plot 1. It appears, therefore, as if the application of the manure by means of the drill is not of so great importance as has been generally supposed.

The crop was harvested with the stripper. A crop harvested in this way does not represent the whole effect of the manure. Harvesting with the stripper always results in the shedding of a portion of the grain, mainly owing to the crop having to be left standing until dead ripe, with the result that a good deal of the grain is knocked out by the wind; this season having been an unusually windy one the loss was unusually heavy. Probably 10 per cent. of the crop was shed in this way. Although shed on the ground it is not lost, because the sheep eat it up after harvesting, and with the present high price of wool it is probable that they make a more profitable use of the grain than if it were sold at 2s. a bushel. I have in column c made an allowance for this shedding of the grain, taking it, not at 10, but only 8 per cent.

The results of the experiment are very instructive and interesting. They represent practically a revolution in our ideas of manuring. In the old country the idea of applying only 10lbs. of manure to the acre would appear ridiculous. Yet on plot 1 10lbs. of concentrated superphosphate to the acre caused an increase of 3·84bush. of wheat per acre. It would require 2lbs. 14ozs. of phosphoric acid to produce 3·84bush. of wheat; 4lbs. 9½ozs. were given in the 10lbs. of concentrated superphosphate. Out of this 4lbs. 9½ozs. 2lbs. 14ozs., or a little more than two-thirds, were used by this crop, there being therefore about one-third left for use for next season. The best result was obtained by the 20lbs. of concentrated superphosphate on plot 3, which resulted in a gain of 6bush. per acre, which would give the farmer a net increase of 9s. 9d. per acre, and which to the country would be worth 2s. 6d. per bushel, or 14s. 2½d. per acre.

The results of plots 1 and 3 may be briefly summed up as follows :—

	Amount of Fertiliser Used per Acre.	Cost of Fertiliser per Acre.	Net Gain to the Farmer per Acre at 2s. per Bushel.	Gross Gain to the Country per Acre at 2s. 6d. per Bushel.
		s. *d.*	*s.* *d.*	*s.* *d.*
Plot 1	10lbs.	1 1½	6 8	9 7
Plot 3	20lbs.	2 3	9 9	15 0

Plots 9 to 15 were for the purpose of testing the effect of nitrogen manuring on the north-western wheat lands. They confirm the results obtained by previous experiments, and show that not only did direct applications of nitrogen result in no increase at the harvest, but that they actually had the effect of lessening the increase which would have been obtained from the phosphoric acid alone.

It is to be noted that these experiments were on fallow land. Good and necessary as fallowing is, yet by fallowing only not more than 12⅛bush. were obtainable, but the fallowing in conjunction with a small amount of phosphatic manure resulted in a yield of 18¼bush.

USE OF FARMYARD MANURE.

Professor W. F. Massey, of the American Agricultural Department, in writing on this subject, says—"Many of our friends still seem to be imbued with the old liking for well-rotted manure. We do not want to let our manure get well rotted before we apply it to the land. The place to rot the manure is in the soil, where you have the soil to absorb everything. If the manure is spread on the surface the soluble parts wash immediately into the land, and the loss is smaller than in any way the manure can be treated, far less than piling in the barnyard, either under cover or not. The evaporation from manure spread on the surface is mainly only water, while the evaporation from piled manure is largely ammonia in a volatile form. No matter how well the manure is handled there will always be more loss from it in the barnyard than in the field. Manure on the surface keeps the soil moist, and prevents the baking of a clay soil. In our experience, right on top as near as may be is the best possible place for the manure. Lately I have had a sample on a small scale of the value of surface manuring on a clay soil. A year ago we built at our college a new lecture hall, laboratory, and greenhouses for my department. To get a level site for the building we had to excavate into a red clay hillside, and pile the clay taken from the excavation in the lower levels On the grounds around the building I have been trying to convert this clay into a garden. Grass plots were formed and large shrubbery beds prepared, and planted in the untamed clay. After everything was planted a good coat of manure was placed on the surface and left there. Last summer was the hottest and dryest ever known here, but it was pleasant to see how things grew and flourished in that clay, which was merely the subsoil piled 3ft. or 4ft. deep. This spring the soil in these beds works as mellow as the traditional ash heap, and the bloom of the roses and shrubbery of all kinds is simply amazing, being fully twice as great as with the same kinds of plants set in natural soil everywhere. I use all manure as a mulch either in garden or field. In the garden, after setting plants or planting seed, the manure is spread over the surface and left there to be slightly worked in during cultivation."

In our dry climate it is a mistake to plough the manure under deeply; it should be worked thoroughly into the surface soil. The *Australasian* states that a few farmers in the Wimmera district have found by actual experiment that, while farmyard manure, if ploughed in is useless, and sometimes injurious to cereal crops, good results are always obtained if it is used as a top-dressing only.

BOTFLIES, GADFLIES, AND BREEZEFLIES.

By J. G. O. Tepper, F.L.S., F.S.Sc., &c.

The insects bearing the above English names belong to the Diptera or two-winged true flies, and are comprised in the family Oestridæ. They are among the most troublesome pests for the pastoralist and the farmer on account of the annoyance, torture, and sickness they cause to his stock wherever they prevail, and the consequent trouble and loss to the owner.

Through the indiscriminate use of the above three names in applying each of them to the same kind, or the same name to different ones, much confusion has resulted. As exactness is one of the chief requisites of true knowledge, it is recommended that their proper use be limited as follows:—The terms "botflies" or "warbles" belong evidently and properly to those kinds only which infest the skin of animals, chiefly cattle, and cause bots (viz, boils or swellings); the name "gadflies" signifies those whose maggots live in the stomach of horses, and that of "breezeflies" those species which inhabit the cavities of nose and throat of sheep principally. If these definitions were adapted much unnecessary ambiguity would be avoided.

In size and appearance these flies resemble bees very much; most of them are densely hairy, usually brown or yellowish in color, and either more or less banded and spotted, or plain. The flies themselves neither sting like March-flies (Tabanus), nor is their life—especially of the males—a long one, as they can take but little or no food owing to their weak mouth parts. The harm wrought by them is wholly due to their larvæ, which are legless maggots.

The botflies or warbles—Oestrus (Linn), Hypoderma (Leach)—place their eggs on the skin of cattle, into which the young, very tiny maggots bore; they grow very fast at first, and cause rather large hollow swellings, a small opening through which the insect, which fills the cavity, breathes. By these the skins are rendered full of holes, and become useless or very much reduced in value. Besides this, and owing to the intense suffering caused by the bot-maggots, the animals become and remain poor, can yield little milk, and are predisposed to other diseases. The larvæ of Oestrus bovis are fat, oval, wrinkled maggots an inch in length, and rather more than half that in thickness when full grown; they then work their way out and drop to the ground. Here they conceal themselves as best they can, and change into hard, rough, puparia, from which the fly emerges in from twenty-six to thirty-six days (Packard). Miss E. A. Ormerod, the noted English economic entomologist, has published various excellent papers on this in several of her annual reports with detailed descriptions, figures, and recommendations of remedies.

The gadflies—Gastrus (Meigen), Gastrophilus (Clark)—place their eggs on parts of the body of horses, mules, and donkeys, which the animals are in the habit of licking. It is said that each female deposits thus from several hundreds to a thousand ova, glueing them singly or in groups to the hair. They hatch rapidly, and the young larvæ, irritating the animals by their movements, are removed by their licking, and a portion is thus conveyed into the mouth and swallowed. Like the botflies, they are legless, spiny, tapering maggots with the mouth, which is surrounded by a ring of recurved spines at the small end. The horses appear perfectly aware of these flies being the cause of great suffering, which the larvæ bring about during their long life in the stomach and intestines; they therefore become restless and sometimes unmanageable when the harmless-looking fly makes known its presence by its humming sound. When the maggots or grubs become mature they pass out with the excrements, bury themselves in the ground in an upright position, an inch or so deep, their skin changes into a hard puparium, from which the flies in the case of Gastrus equi emerge in from thirty to forty days.

The gadflies and botflies are separated in external appearance by the veins of their wings chiefly. The former have all the veins running straight to the margin, and have no cross veins near it; while the fourth vein of the latter curves upwards near the margin, ending near the third in the tip, with a cross vein near the bend, and nearly parallel with the margin, connects the fourth with the fifth. Figures of Gastrus (Gastrophila) equi (L.) and Oestrus (Hypoderma) bovis are given in Kirby's Textbook of Entomology, plate 86, and also with those of the larvæ in Packard's Study of Insects, 1880 edition, p. 404, besides other works.

The breezeflies, *i.e.*, those whose larvæ infest the nose and throat of sheep and other animals (even of man sometimes), belong to Oestrus, Cephalomyia, and other genera, and are usually less hairy than the preceding. Although also causing great suffering, they are said not to be the cause of "giddiness" of the sheep. The flies deposit their eggs on or near the nose, into which the speedily-hatched larvæ soon find their way. They occur, like the others, in the Old World and America, but none appear to have been observed in Australia till recently.

The first intimation the writer received that Oestridæ existed in Australia was by the receipt of some spiny larvæ in spirit from the Far North, and alleged to have dropped from the noses of camels. Although more information was asked for, none has been received since.

The next intimation was the remittance of a fly from Echunga by Mr. M. W. Kavanagh, about the middle of December last, and two more during the current month (January). The description of the behavior of the horses and flies given by the sender is very similar to that of the European horse gadfly and its effect on the animals. The species is, however, much smaller, being scarcely half an inch long, of nearly uniform brown color, and clear unspotted wings. As in its congeners, the body of the female is tapering, the pointed end being curved beneath the abdomen. That of the first sent had a bunch of the eggs still attached. No males have yet been seen. None of the descriptions accessible to the writer fit the Echunga fly; it is therefore probably an Asiatic or African form.

For general information, the description of the habits of the female and the larvæ of the European gadfly, by Brehm (Thierleben), may be given. "She belongs to those kinds which love high places (*i e.*, before pairing—Transl.). Upon a bare hilltop, never visited by horses, one hovered around me, settled on my coat, and permitted me to catch her. When fertilised, the female goes to work in bright, warm weather. Swiftly and restlessly she hovers around the horse which presents itself in meadow or field or on the road, clings to its hair just long enough to deposit one or more eggs, flies away, returns again, and continues thus to act as long as the weather, the time of day, or the presence of the horse, mule, or donkey permits; it never follows them into the stable or into water. . . . . In the stomach the maggots hook themselves securely, single ones sometimes also in the throat, and one finds nests of them of fifty to a hundred, consisting of larger and smaller cells and depressions. They suck there on the internal skin like leeches, forming tiny pits, and in time rather large cavities, which secrete a peculiar pus-like fluid which serves them as their food. These places heal again when left by the larvæ, and form scars. At first the larvæ grow very fast, and sometimes change their places. After having thus wrought mischief for about ten months, they leave the tortured animals with the excreta. In the long road through the intestines the larvæ pass through their last changes; at least, it has never been possible to breed the flies from larvæ taken from the stomach of horses which succumbed through them."

In conclusion, it may be remarked that should these flies overrun the country it would be a most serious matter—as remedies are all more or less precarious—and afford another instance of possible and probable disastrous consequences due to the injudicious destruction of our native birds by fire, gun, nesting, denudation of timber, and the diminution of the water supply in summer.

CYANIDE OF POTASSIUM FOR POISONING RABBITS.

Some few weeks since the manager of the Government cyanide works, at Mount Torrens, reported favorably on the efficacy of a weak solution of cyanide of potassium for poisoning rabbits, and the following report to the Commissioner of Crown Lands, by Mr. S. G. Hübbe, of the Survey Department, will be of interest to those who wish to try this method of destroying rabbits:—"I have the honor to report that I have conducted experiments with water poisoned with cyanide of potassium for the purpose of destroying rabbits. Blocks A, K, hundred of Hay, leased to Mrs. Helen Coleman, on which the experiment was to have been carried out, was reached on the 16th instant., when, finding that none of the dams on those blocks were suitable for the experiments, I obtained permission to erect the netting kindly supplied by the Messrs. Coleman around two small dams adjoining each other on land comprised in section 293, hundred of Eba, adjoining block K, hundred Hay, and occupied by Mr. J. A. A. Zander. The erection of the netting around these two dams was completed on the night of the 18th instant, and, after sunset, 12½galls. of water, poisoned with one part of cyanide of potassium to 1,000 parts of water was placed in suitable positions close to and outside of the netting in shallow tin vessels, remained there until daybreak, and was removed by me, as horses and cattle were depastured in the paddock. On the night of the 19th instant the poisoned water was placed as before, the weather being most unfavorable for the experiment, as an exceedingly cold south-east wind blew throughout both nights. Following the operations of the 18th instant, on the morning of the 19th instant, I examined the vessels containing the poisoned water, and found that 1gall. water had been taken by rabbits, and on searching for results seven dead rabbits were found from 18in. to 3yds. from the vessels containing the poisoned water, three dead ones from 3 or 4 chains away, and one dead rabbit 10 chains from the dams. Of these eleven rabbits, three were old and fully grown, six half grown, and two were young ones. Then searched the surroundings of the dam for a radius of 20 chains, further traversing the land on foot in circles, but failed to find further evidence of the poison's action. The night having been cold, and the rabbits not having been previously shut out from the water, I considered they were not sufficiently thirsty to induce them to drink readily under the altered circumstances, and am strongly under the impression that the dead rabbits found were the only ones who had partaken of the poison. I therefore decided to remain over the day, and repeat the experiment on the night of the 19th instant. This was done, the poisoned water being placed as on the night of the 18th instant. At daybreak on the morning of the 20th instant results were again searched for, when it was found that seventy-seven dead rabbits, the majority being old and fully grown, were lying within the old post and wire enclosure surrounding the two dams, the area approximating to about half an acre. Three others had partaken of the poison and were not quite dead, but beyond hope of recovery, and three more, who were evidently affected by the poison, were making off through the stubble. Many of the rabbits found within the enclosure were lying ten and twelve deep within a few feet of the vessels from which they had drank, and three, two of which were full grown, had dropped and fallen into the vessels containing the water from which they had drunk. Had time permitted I have little doubt that many more dead rabbits would have been found, but as I had to inspect results of the Toxa experiments conducted on the previous day on land comprised in the adjoining block K, hundred of Hay, no further search was instituted by me, more especially as from the results above set forth I am fully satisfied that a most valuable medium of rabbit destruction during the hot, dry months at a merely nominal cost can be introduced, the poison (cyanide of potassium) costing only 1s. per pound, and 1lb. being sufficient to poison 100galls. of water. So strongly am I impressed with the value of this method of destruction, that I recommend that I should be supplied with a quantity of wire netting, some iron stakes, cyanide of potassium, and a few 5ft. lengths of semi-circular sheep troughing, in order that the value of this poison may be further demonstrated, either on leased lands in the neighborhood of Port Augusta, or in the Gawler Ranges, when I am *en route* to the west coast. Should it, however, be considered that its value has been sufficiently established, I would recommend that the attention of Crown lessees and others interested in rabbit destruction be prominently drawn to this most rapid and effective mode. I would also suggest attention to the fact that as rabbits die in close proximity to the poisoned water, no difficulty will be experienced in recovery of the bodies, so that this should be a further inducement for its general adoption both by occupiers of land and men who gain their living by rabbiting during the summer months, as the skins, which are of fair marketable value, will be recovered in the early morning before they are damaged by crows, hawks, &c., which is not the case when arsenic, strychnine, and phosphorus is employed. Should it be decided to direct public attention to the use of cyanide of potassium, it should also be notified that this poison is a most deadly one, and that every care should be taken to prevent its absorption either by inhalation or through cuts and abrasions on the hands or other places. In conclusion, I would add that I found the readiest and most simple method of dissolving this poison is with boiling water."

As cyanide of potassium is a most deadly poison, the greatest care must be exercised to prevent children obtaining access to same, and also to prevent stock of all description drinking the poisoned water. This remedy will probably only prove efficacious in hot weather where water is scarce and the dams and other supplies can be readily enclosed, so that the rabbits must drink the poisoned water or go without.

THE SOILS OF THE RENMARK IRRIGATION COLONY.

REPORT BY PROFESSOR LOWRIE TO ROYAL COMMISSION ON RENMARK AND THE RIVER MURRAY SETTLEMENTS.

I have the honor to report that, in accordance with instructions, I visited Renmark with Mr. Quinn, Inspector of Fruit. We were courteously received by the landholders and public officials of the settlement; we had full opportunity to inspect the blocks, and especially the parts thereof where troubles have arisen, and the information on many matters which experience of work there has evolved was freely volunteered.

The position of the colony impressed me as particularly grave, and I sympathise with the men who have expended much capital and labor and now see the shadow of failure creeping all too quickly over their work when they had hoped to be gathering the fruition thereof.

The trouble, so far, is evidenced chiefly on blocks planted with apricots. In places these trees have died out, almost a clean sweep, and have been uprooted, and the land has been planted with lemons or vines or put to other uses; and in other places the dying of the trees has been sporadic. On a few of the more intractable areas the owners, with much perseverance and very much faith, have planted and uprooted even to the third time. All round there are symptoms sufficient to justify the anxiety that the failure of apricots occurring now only but forecast the general failure of other fruit trees and vines later.

I will respectfully say at once that a reliable diagnosis of the troubles is not to be made by one brief visit such as Mr. Quinn and myself were able to make. Towards that end observations taken through the course of at least one year would be necessary, and even then further data might be required. It is not sufficient in a case such as this, where large sums of money may be involved and the value of property may be affected, to argue from analogy or to fall back on hypothesis. An authoritive report can be written only by the man, however well informed he may be, who has had opportunity to follow up his hypothesis and test supposed analogies. The minutest details are worth gathering up, and no change or circumstance likely to throw light on the problem should be wittingly missed. It is in this relation that the owner of the land has an immense advantage over the man who simply visits it, and I have no doubt that if the acquired experience of the settlers could be properly scheduled it would go far to determine the remedies to be used to avert the failure. From conversations I had with different men at Renmark I am the more confirmed in this opinion. To show how inadequate this report must necessarily be I will instance some of the lines of investigation which would, no doubt, furnish facts for an authoritative report:-

1. Analysis of samples of soils and subsoils taken at intervals throughout the year.
2. The effects of various methods of cultivation--varied in the implements employed, depth, frequency, and season.
3. The influence of different methods of irrigation-- quantity of water used, frequency of application, and mode of distribution--in relation to soil, subsoil, and trees.
4. The results of the use of varied organic and mineral manures.
5. The consequences of such amendments of the soil as dressings of gypsum or quicklime, and under-drainage of the land.

6. The influence of the growth of crops in the orchards between the rows of trees—crops such as peas, mangolds, cabbages, lucern, or even cereals, each directly manured as affecting thorough shading of the soil, the percentages of noxious salts in the surface soil, and the vitality of the trees. The economy of such practice as well as the physico-chemical effects on the soil would have to be determined.

In the face of this outline it will be recognised that this report must perforce be limited and cursory, as it is written after one brief visit.

A complete investigation would, I believe, reveal a variety of causes acting more or less concomitantly—with sometimes one influence more marked, sometimes another—accounting for the dying off of the trees.

These I instance as some of the more prominent:—

1. Relative sterility of the soil arising from abnormal chemical constitution, such as (*a*) the presence of injurious salts, (*b*) the relative deficiency of constituents indispensable to fertility.
2. Inferior texture and intractable physical condition of the soil in a few places and of the subsoil in many places.
3. Injudicious irrigation and soakage of water from irrigation channels.
4. Unsuitable cultivation.
5. Incompatibility of climate and environment for at least some of the kinds of trees planted.

One or other of these causes, it is almost needless to say, may endamage the vitality of the trees, but disaster in many instances at Renmark seems to arise from a combination of them.

It is desirable, I think, to discuss these issues in detail:—

I.—CHEMICAL COMPOSITION OF THE SOILS.

[The analyses of samples of soil and subsoil taken by us were made by Mr. Goyder.]

1. *Surface Soil from Captain Bovill's Block.*

Moisture	3·14	Potash	0·70
*Organic matter and combined water	2·94	Sulphuric acid	0·05
Insoluble	83·70	Phosphoric acid	0·07
Alumina	4·86	Chlorine	0·03
Ferric oxide	2·44	Carbon dioxide	0·47
Lime	0·72		
Magnesia	0·72		100·00
Soda	0·16		

* Containing 0·05 nitrogen.

2. *Subsoil under the above.*

Moisture	4·26	Magnesia	1·04
Organic matter and combined water	2·71	Soda	0·56
Insoluble	63·00	Potash	0·59
Alumina	6·04	Sulphuric acid	0·07
Ferric oxide	2·40	Phosphoric acid	0·06
Lime	10·17	Chlorine	0·04
		Carbon dioxide	8·00

These samples were taken from a part of the orchard where the trees were healthy. The important features disclosed by the analysis are—

(*a*) Deficiency of organic matter and organic nitrogen.
(*b*) Relatively low percentage of phosphoric acid.
(*c*) Abundance of potash.

One would not expect to find a percentage of organic matter as high in an arid as in a humid climate, but would expect the humus to contain, under conditions prevailing at Renmark, a high proportion of nitrogen. The figure given is low, and the need of organic manures in the soil is at once suggested by it. At Renmark there are no economic facilities for keeping stock, and farmyard manure accordingly is not to be had in quantity. One of the owners at the time of my visit was carting sheep manure—scrapings from sheepyards and shearing shed—from a distant station. He had discovered, I think correctly, that such manuring, even at considerable expense, was justified. I would recommend good guano, the refuse from boiling-down works, bonedust with a high percentage of organic matter present; and, failing these mixtures of nitrogenous and phosphatic manures, such as (1) nitrate of soda mixed with bonedust or good phosphatic guano or basic slag, and (2) sulphate of ammonia mixed with superphosphate or bonedust, according to the prices at which, respectively, they could be delivered at the orchards. Much could be done towards increasing the percentage of humus, and with it the percentage of nitrogen, by the growth of leguminous crops between the rows of trees and ploughing these under. These crops, manured heavily with phosphates, would grow vigorously on much of the land, and by ploughing in crop after crop, as can be done where water is available, might be made a direct means of increasing the organic matter in the soil. No doubt this will be reckoned a costly procedure, but the alternative to it is the direct application of nitrogenous manures, and these have always a high value. The suggestion to green manure land in South Australia is, I know, not likely to find much favor, but under the special conditions prevailing at Renmark— extreme poverty of nitrogen, expensive carriage on manures by rail and boat, the importance of organic matter in irrigated lands, and the presence of available water— I offer it after careful thought. To-day, when artificial manures can be so readily had in most countries, green manuring is not extensively practised, we all know, but it is nevertheless still carried on in some countries. In Germany the vetch, the pea, the blue and the yellow lupin, and clover are grown in some districts to be ploughed in with success.

Dr. Wagner has done much to encourage the practice there. "For three successive years" (I quote from a translation) "I sowed vetches and peas in August on plots of soil poor in nitrogen, and put the mass of the green plants under the ground in late autumn. The green-manure plants grew with such extraordinary vigor, when copiously manured with phosphoric acid and potash, that for three successive years they yielded, exclusive of their roots, about 180lbs. of atmospheric nitrogen per acre." To supply this amount of nitrogen nearly 8cwts. of sulphate of ammonia per acre would be required, and this would cost upwards of £5 per acre at Renmark. Another experimenter (Neuhaus) demonstrated that by growing and ploughing in a large crop of lupins on stubble land he was able to enrich the soil in nitrogen to a degree equivalent to the addition of 11 tons of farmyard manure per acre. In the Southern States the cow pea has been used as a green manure, and at the Louisiana Experimental Station a crop ploughed in enriched the soil to the extent of 65lbs. of nitrogen per acre—an amount which could not be applied at Renmark for less than 30s. to 35s. per acre.

I have advanced these instances in justification of the suggestion to green manure where there is reason to fear deficiency of nitrogen. But everyone knows that other advantages accrue from an increase of the amount of organic matter—advantages such as, among others, increased humidity, improved physical condition, acceleration of ameliorating changes, and quickened activity of soil ferments. Again, the shading of the soil and the presence of rank vegetative growth will lessen the evaporation of water from the surface and the consequent rising of salts, from which trouble extensive has already risen, and of which worse remains behind, I fear, unless the present practice of cultivation is changed or amendments more or less costly are introduced. The organic matter can be increased by the ploughing in of any rank vegetative growth, but to increase the nitrogen the selection is limited to leguminous plants which, it is a matter of common knowledge nowadays, have the power, exceptional among plants, of utilising readily the free nitrogen of the atmosphere through the medium of microscopic organisms associated with their roots. It is not for me, in the absence of direct experience, to forecast what crops will grow or what will fail there; but, guided by the results of the valuable investigations of Professor Hilgard and Mr. Loughbridge relative to alkali lands—of which results the Renmark owners through the efforts of some of their leading men are familiar —where the conclusion was drawn that legumes are among crops extremely intolerant of common salt, sulphate of soda, or carbonate of soda, one would anticipate in some of the holdings difficulty in growing such crops at all luxuriantly. There may or may not be difficulty with certain legumes, *e.g.*, lupins, through absence of such ferments in the soil as associate symbiotically with their roots. But I recommend direct trial in the belief that if luxuriant crops well manured with phosphates can be ploughed in green, the soil will very soon reach a satisfactory condition so far as the percentage of nitrogen and phosphoric acid are concerned. The percentage of phosphoric acid is not so low, relatively, as that of nitrogen, but it is low enough to warrant ready response of the soil to phosphoric manuring. The position will be more readily understood from the following table of percentage of phosphoric acid in the soils of different countries of average quality there :—

Good average soils in		England	0·12	per cent.	phosphoric acid
"	"	U.S. America (humid regions)	0·113	"	"
"	"	" (arid regions)..	0·117	"	"
"	"	France	0·1	"	"
"	"	India	0·178	"	"

The Renmark sample gives 0·07 per cent. of phosphoric acid, and by comparing that with good average soils elsewhere it is evident enough that the soil cannot be otherwise described than as somewhat low in phosphoric acid. The difference between 0·07 and 0·117 looks small enough, but when it is put in pounds per acre of phosphoric acid the deficiency is more evident. In the case of Renmark the total per acre to 9in. deep would be roughly 2,450lbs. per acre, and in the arid regions of the United States approximately 4,100lbs.—a difference of nearly three-fourths of a ton, Good bonedust contains over 20 per cent. of phosphoric acid and the quantity required to make up the difference is easily enough calculated, and we have to bear in mind that only a fraction of the total present is at any one time available for plants. It will be sufficient for my purpose towards demonstrating the utility of phosphatic manures on this soil to state on the authority of Deherain that lands containing less than 0·1 per cent. of total phosphoric acid respond successfully to phosphatic manures, and to point out that this soil falls short of this amount of phosphoric acid by nearly one-third of the whole.

I take it, then, that this soil is deficient in nitrogen and phosphoric acid —constituents indispensable to fertility —and accordingly for the best results requires manuring as indicated. The decomposition of the organic matter ploughed in, and the consequent evolution of carbonic acid, will, in the presence of the alkali or efflorescent salts such as prevail on Renmark lands, be relatively rapid; and as it is in the presence of water and carbonic acid that the reactions of carbonate of lime with sodium chlorides, whereby sodium carbonate- the most deleterious of these efflorescent salts is formed, takes place, there may be some hesitation in adopting means to increase the organic matter. But gypsum is fortunately to be had for the carting of it only a short distance, and accordingly the neutralising of carbonate of soda is cheap enough, and there need be no anxiety from this point of view.

Potash in the lower levels at least will, I would anticipate, continue in sufficiency for a generation yet to come. It is characteristic of arid lands to be rich in potash, and apparently Renmark soils are no exception in this respect. The pine rises and drift soils of the higher levels will be the first within the irrigation area to show, I believe, any deficiency in this constituent. But the serious difficulty at Renmark arises from the presence of excess of alkali salts rather than from absence of sufficiency of plant requirements.

I will now give a statement showing the percentage of soluble salts in the samples of soils which were taken from the blocks indicated by us and analysed by Mr. Goyder:—

	Total Soluble.	Fixed Carbonic Acid.	Chlorine.	Sulphuric Acid Radical.	Calcium.	Magnesium
(A) Captain Bovill's Block						
(Where trees were dying or dead).						
3. Surface soil	·199	·042	·036	·016	·016	·002
4. Subsoil	·291	·045	·057	·033	·006	·002
5. Surface scraped off midway between rows of trees	2·472	·048	1·007	·255	·371	trace
(B) Mr. Cresswell's Land						
(Apricots dead and uprooted).						
6. Soil	·130	·030	·012	·012	·005	trace
7. Subsoil	·213	·030	·033	·027	·006	·001
(C) Mr. Peppercorn's Land						
(Citrus trees doing well, but not fruiting satisfactorily. Apricots dying. Subsoil very wet).						
9. Surface soil	·084	·019	·014	·011	·010	trace
Mr. Turner's.						
11. Surface soil	·121	·030	·011	·020	·021	·002
Mr. Wyllie's Block.						
12. Subsoil (24in.)	.221	·026	·056	·032	·018	·002
13. Surface (to depth 1in.)..................	·053	·015	·002	·011	·001	·001
Colonel Morant's						
(Where apricots failed three times successively planted).						
14. Soil	·101	·012	·003	·022	·003	·001
15. Subsoil	·234	·065	·009	·040	·006	trace
Mr. Barrell's.						
16. Surface soil	·149	·026	·009	·038	·008	·

Let it not be understood that these figures indicate average conditions. The samples of soil and subsoil were taken from parts of the various blocks where failures had occurred or were occurring, and they indicate the condition of some of the worst spots on the whole area. The ugly feature of the statement is that it indicates a growing evil, for the trees on some of the places would not have succeeded for the few years that they did had the salts been present in such quantity from the first.

Before we consider these results in detail it may be worth while to notice that the vegetation of the country in its natural state, and the surface efflorescence to be seen so frequently, indicate alkalinity, and are sufficient at least to awaken suspicions of a high percentage of soluble salts in the soils. The saltbush and native vegetation on such country is generally held to indicate light rainfall; but it also points to a relatively high percentage of soluble salts. We might almost take it, I think, that Goyder's line of rainfall means more than a line dividing degrees of meteorological conditions; that it serves to define areas where the percentage of salts of the alkalis or alkali-earths is high. Of course the one follows from the other as cause and effect; but this connection has not, probably because wheat can withstand or tolerate a very high percentage of alkali salts (up to 5 per cent. or more), been generally appreciated. If the saltbush, and plants of similar character found thriving with it, had been looked at more from their capacity of withstanding saline conditions than of withstanding drought, there might have been more hesitation in allowing that available water and ordinary orchard cultivation were all that was required to make this desert country produce a wealth of fruit. Where the rainfall is so light the soluble salts of magnesia, lime, potash, and soda, which are formed as the result of the ever-acting weathering agencies—the chemical and physical changes and biological activities in the soil—are not leached out in anything like the same degree as in more humid country. Light though the rainfall be, there is a sufficiency to dissolve these salts at the surface; there is water enough to moisten the subsoil and to carry the dissolved salts down into the subsoil a greater or less distance, but not enough to carry them off in solution to the country drainage. The water returns to the surface by capillary action, and, being evaporated, deposits these salts at the surface, augmented by salts dissolved below, and of course brought up in additional traces as time passes. An occasional heavy downpour, especially on rising grounds and sloping country, will wash away a percentage of these soluble salts into the country drainage or to lower levels, but the trend in arid countries is towards increase of the salts at the surface. I need not burden this report by enumerating instances, but one or two may be given, and I take the countries where investigations of the phenomena have been made. In India vast areas of land are sterile owing to the presence in the soil and on the surface of soluble salts, chiefly soda salts. Such country is termed "usar" land, and the efflorescent salts "reh." In the north-west provinces alone there are upwards of 5,000 square miles of such barren land. In America it is designated alkali land, and prevails in the more arid districts. In whatever country it be found, it seems to be admitted that the main determining factor is deficient rainfall, or rainfall badly distributed throughout the year, and that the degree of alkali is modified by the perviousness of the soil and underlying substrata, by the configuration of the country, and also by the rate of evaporation. Now, when the land in such country is irrigated the water permeates the subsoil more deeply, and, under evaporation, deposits at the surface soluble salts drawn from greater depth than would be the case under the average rainfall. The next application dissolves these salts, carries them down some distance, no doubt, but deposits them again, when, through capillarity, it rises again to the surface, and the deposit is increased by traces of soluble salts which the water may have further dissolved in its downward and upward movements. Thus it has been found that irrigation under these conditions tends to the increase of alkali unless the surface slope or perviousness of the subsoil be specially favorable and the soil such that that its capillary action is low and rate of evaporation slow.

At Renmark the soils with alkali present when irrigation was begun have under this irrigation gradually become more impregnated until in places vegetative life is seriously affected and trees less tolerant are killed outright. Again, the irrigated areas have different levels, and there has been soakage or seepage from the higher level channels, as is evidenced in places by the increased efflorescence adjacent to the channels when the percolating water comes to the surface there. But such water may also drain slowly, no doubt nevertheless severely, with water from high level blocks where irrigation may have been used in excess to lower levels, and in passing through intervening soil will naturally become more highly charged with salts until at the outcrop, or when it may find its way to the surface again, the soil will become impregnated rapidly and more and more sterile as the process proceeds. There is evidence also, for example, in Mr. Wyllie's block that the watertable has been raised through this percolation from higher levels until it is near the surface. The bottom water is, of course, highly charged with salts reached from the country through which it has soaked, and one can understand that the constant evaporation of this rising water must rapidly increase the alkali salts at the surface and play havoc later with the fruit trees. In all this Renmark but repeats the experience of some other countries; the difference is only one of degree.

So much for the general position. We will now look at the results given in the above table in detail. On Captain Bovill's block some parts are healthy for the apricot; on other parts the trees are dying. We took several samples for analysis (Nos. 1 to 5) and from spots healthy and unhealthy respectively. By the analysis of No. 1 manuring is suggested as already referred to, but Nos. 3, 4, and 5, taken when the trees were failing or dead, indicate excess of soluble salts as the trouble. In Australia no work, as far as I know, has been done to determine the limit of tolerance for different crops or for fruit trees of soluble salts in alkaline soils under our climate. The chemical departments of the other colonies may have worked at the subject, but I am not aware of it if such work has been undertaken. I have already referred to the very excellent work that has been conducted by Professor Hilgard, of the University of California, and the chemists associated with him for many years in relation to alkali lands. All countries similarly situated are much his debtors for the valuable information advanced. In the absence of data, which a long period of work at Renmark alone could furnish, I am forced to argue from analogy, but I do not fail to recognise that the analogy is not complete—that the climatic differences must not be neglected. Added to this difficulty as reasons to make one hesitate to offer dogmatic or *ex cathedrâ* utterances is the fact of differences among the authorities relative to the percentage of soluble salts which a soil may contain without becoming sterile. These differences, no doubt, arise from the fact that climatic soil and subsoil affect the position. Muntz and Girard, for example, state that 0·1 per cent of common salt is the limit, and that anything over that amount renders the soil unsuitable for most crops. Deherain gives it that "a soil habitually humid may contain 2 per cent. of salt without ceasing to be fit for vegetation, but in a dry climate 1 per cent. suffices to bring about sterility." In America 0·23 per cent. of total soluble salts was found at Tulare Experimental Station "to be the maximum amount compatible with ordinary weed vegetation," and 0·08 per cent. carbonate of soda was found sufficient in an *adobe* soil to prevent tillage and any useful plant growth. The percentage, sufficient to seriously affect vegetation, is, of course, not constant; but one is forced to question Deherain's position, even while allowing that the effect is subject to many modifying factors, such as degree of humidity of the climate, character of the soil and subsoil, presence of a hard pan under the surface, and the relative proportions of different salts present. The soluble salts generally consist chiefly of sulphate of soda, carbonate of soda, common salt, sulphate of potash, and sulphate of magnesia with, of course, such plant food salts in quantity more or less as nitrates and phosphates. Of the salts of soda—the salts which cause the trouble the carbonate has been found by much the most injurious, the chloride comes next, and the sulphate is the least deleterious. Hilgard puts it that as much as 0·5 per cent. of sulphate of soda may be present in a soil without materially interfering with the growth of most crops. Now, in the soluble salts at Renmark carbonates, sulphates, and chlorides are all present, and in my opinion we need go no further for an explanation of the failure of apricot trees. The scarcity of nitrogen in the soil no doubt had effect on the health of the trees, as the apricot is a greedy nitrogen consumer, but the bottom of the trouble—the predominant affecting cause—is I think the presence of too high a percentage of alkali salts. Analysis No. 5, which was from the top inch or thereabout, should in itself, I think, be sufficient to convince us.

On Mr. Cresswell's land the percentage of soluble salts in the sample taken is lower than in those from Captain Bovill's block, but we must bear in mind that it is characteristic of alkali land to vary rapidly horizontally in the degree of alkali present, and that parts of the block may have more as others may have less than the sample analysed. No doubt ·130 per cent. soluble salts looks very small, but it means over 5,000lbs. per acre per foot deep, and the subsoil shows nearly two-thirds more. Now, Mr. Loughbridge in his researches on alkali land found, near Fresno, that total salts of 4,600lbs. per acre killed both vines and pear trees. I have said already that the same percentage has not by any means always the same effect, and on the Tulare station the same experimenter found that vines lived where the total salts in the first foot reached 23,800lbs., or about ·5 per cent., that they barely lived where the first foot contained 5,330lbs. (about the same quantity as Mr. Cresswell's), and that they died outright where the total salts reached 36,750lbs. in the first foot. It may be taken, therefore, that the percentage of salts here is more than sufficient to affect the health of the trees. But on this block there were other unsatisfactory conditions: in parts it was stubborn, raw land, looking as if the subsoil had been exposed in grading for irrigation, and the subsoil where we examined it looked impervious, cold, ungrateful stuff. No doubt the imperviousness of the subsoil, and the character of it generally has had effect on this case and acted against the health of the trees conjointly with the alkali salts, but as these salts have had effect in bringing about the intractability of the subsoil, and in places the surface soil, they account ultimately for the trouble.

For the failure in Mr. Peppercorn's block the data at my disposal are not sufficient for me to advance any hypothesis. That other kinds of trees were growing satisfactorily discounts any suggestion of poverty; there is no pronounced hard pan as on other blocks; the percentage of soluble salts is relatively low, and the soil looks outward a nice, free, grateful, sandy loam. If it had been for any length of time saturated with moisture, as it was at the time of my visit, I should not wonder that apricots failed. In 1890, when through floods (exceptional) we had nearly twice the average rainfall at the College, we had evidence that the apricot will not withstand waterlogging, for on the heavier land the young trees succumbed, but did well on brashy limestone adjoining, but through which excess water readily percolated. That this block was over-irrigated of course I have no evidence apart from the suggestive saturated subsoil.

On Mr. Turner's land only a few trees had failed, but underlying these was a pronounced hard pan, which must have been adverse to the health of the trees; and when there has been added to this the increase of soluble salts, even though in no alarming amount, consequent to seepage from the higher irrigated land, the trees can scarcely be expected to succeed.

On Mr. Wyllie's land all outward appearance indicated alkali. The stiff, obdurate, raw, cold soil and subsoil suggest it; the color of the water in a pool or two on it pointed to dissolved humus through the agency of carbonate of soda; and a hole, which had been sunk on the margin of the block, almost full to the surface of stagnant water charged with salts and maintaining almost a constant level, evidenced deleterious bottom water. The analysis goes to confirm the outward indications, and the subsoil at least satisfies me that salts are present in sufficient quantity to be harmful.

On Colonel Morant's block a small area was examined on which apricots have failed successively three times. A look at the figures for the subsoil must convince one that the cause of the trouble is particularly the quantity of carbonate of soda present. Practically the percentage of this alkaline salt is 0·1 per cent. in the subsoil—more than enough to render the land unfit altogether for fruit trees owing to its corrosive action on the roots and neck of the tree.

Of Mr. Barrell's land much the same opinion must be given as for others already referred to where the percentage of salts is similar.

II.—Physical Condition of the Soil and Subsoil.

On the lower level areas the soil in places is stiff, cold, and intractable. It is difficult to work in its natural state, but under irrigation it proves more awkward to handle. I have already instanced Mr. Cresswell's and Mr. Wyllie's blocks as examples, and Mr. Hollingdrake's and some others might be added. The soil on places of considerable extent is so plastic and adhesive as to make it difficult to get any tilth; at one time it is as hard as cement, at another adhesive and plastic, according to the moisture present. The want of mellowness must prove a drawback to the health of the trees. A hard pan underlying the surface soil also is found widely distributed, though not continuous, over the blocks on all the levels. I noticed again and again this impervious hard pan, which, in itself, one would expect to seriously affect trees planted over it unless it had been burst up systematically were the trees were planted. This hard pan might have been anticipated on parts of the area at least, for it is a common geological condition in arid country—not necessarily continuous, but generally found in places varying in extent, depth, imperviousness, and of course composition. It is a direct result of limited rainfall, for the fine clay is not washed off in suspension in muddy brooks, but goes down in the soil in suspension in the percolating water; and with carbonate of lime, and salts of the alkalis and alkaline earths and metals, tends to form a layer of hard (almost cemented) material which stops the downward progress of the roots, holds water, and prevents aeration. In the report of the Agricultural Experiment Station of the University of California, 1898, I find the following in reference to one of the sub-stations, which I think is specially pertinent:—"The trees grew well for a few years," it is reported, "until their roots reached hard pan; then the roots spread widely, and while exhausting the surface soil made good trunks and tops in many cases. As the shallow surface soil ceased to yield nutriment the top died back or became diseased." In the same report is a most interesting tabulated statement by Mr. Loughbridge showing the results of hard pan and alkali in a vineyard near Fresno, and which has direct analogy in spots of the Renmark area, sufficient to justify my introducing it here.

Vineyard, Fresno.

No. of Sample.	Carbonate of Soda present per Acre.	Effect in Vines—Condition.	Remarks
1	None	Good	No hard pan
2	"	"	Hard pan at 4ft.
3	Total salts, 4,600lbs., chiefly common salt	Pears and vines dead	Hard pan at 5ft.
4	None	Vigorous	Hard pan at 2ft. 9in., but easily crushed
5	Soil, very little; 3-4ft., very little; carbonate of lime; hard pan	Vines dead	Hard pan at 4ft. 3in.
6	Very little	Good	Hard pan at 2ft. 8in.
7	About 1,000lbs.	Dead	" 3ft. 6in.
8	"	"	" 3ft. 6in.
9	Very little	Good	" 4ft. 3in.
10	"	Weak	" 3ft. 2in.
11	"	Dead	" 2ft. 9in.
12	None	Excellent	" 5ft.
13	"	"	None
14	"	Strong	Hard pan at 3ft.
15	Soil, about 1,000lbs.; 25-36in., about 2,000lbs.; 36-48in., about 2,000lbs.	Vines dead	Hard pan at 2ft. 10in., but soft
16	None	Strong	Hard pan at 4ft. 2in.
17	Soil, probably 1,500lbs.; 24-35in., probably 2,000lbs.	Dead	" 4ft. 6in.
18	None	Strong	None
19	Soil, none; hard pan; carbonate of lime	Vines dead	Hard pan at 14in.

Mr. Loughbridge, commenting on this statement, says:—"The important fact of the evil of hard pan, is in this case, well demonstrated. In eight of the localities where the vines were dead one was charged with a great deal of common salt, which apparently killed not only vines, but also pear trees. Six of the others, while containing alkali, were underlaid by a hard pan of carbonate of lime at 2½ft. to 4½ft. sufficiently hard to resist the passage of the roots downward as well as rise of water upward from below, and thus produced the death of the vines. In the other case (No. 15) the presence of the soft hard pan at about 3ft. in the strongly alkali soil indicates a greater concentration of the alkali at that depth, and the consequent destruction of the vine. The effect of differences in depth to the hard pan is shown in Nos. 9, 10, and 11, on which the vines were doing well, even when the hard pan was below 4ft., were weak when at 3ft., and dead when it was less than that distance from the surface. On the other hand, in cases where the vines were doing well, even when the hard pan was within a short distance of the surface (No. 6), it is more than probable that the latter was more or less fractured, or in some other manner permitted the passage of roots. The lesson is thus made emphatic to all orchardists and vineyardists that before planting it is important to examine the conditions existing in the soil at depths to which roots will penetrate, and, if possible, to remove or counteract any evil that may exist, such as blasting in the case of hard pan and the use of gypsum where black alkali is found." There is, therefore, I think, ground for the belief that the hard pan of varying imperviousness at Renmark is in places a source of harm.

III.—Injudicious Irrigation.

Injudicious irrigation may in some instances have done injury. The uncertainty felt occasionally in the past as to the availability of water when required may have tempted some into excessive use of it when it was to be had. On the other hand, a period of scarcity of water on irrigated orchards is a serious matter, for before the want of it is noticeable on the trees harm considerable may have been done. The investigations of Hellriegel, in Prussia, have demonstrated that when a plant begins to wilt mischief has already been done. Unhealthy conditions must have prevailed for some time in its tissues before the moisture has been reduced to such a degree as to bring about wilting of the leaves. The temperature in the tissues of the plant rises under the sun's heat above that of the circumambient air, and this rise of temperature quickly affects the efficiency of the elaborative processes in the plant. There is, therefore, danger where plants or trees depend on irrigation of their suffering from want of water, and they have suffered, let me say again, when wilting takes place, but in alkali lands especially there is graver danger from the use of excess of water as it leaches soluble salts from a greater depth in the subsoil and increases more rapidly the surface alkalinity. In this respect the sin of the man who working on alkali lands thinks it well to err on the safe side from his point of view and applies more than a sufficiency of water finds him out. I have no absolute evidence that over-irrigation has brought trouble on any of the blocks, but the condition of the subsoil and even the soil in more than one instance which I examined suggested as much.

IV.—Want of Suitable Cultivation.

Want of suitable cultivation appeared to me another source of trouble. Only some of the settlers, as far as I could ascertain, sufficiently appreciated deep cultivation. Mr. Chaffey's block I would instance as evidence of vigorous work. There seems to be too much Planet Junior work or work of that type and too little use of the single-furrow plough with two strong horses in it. Renmark is no exception in this colony in adopting light cultivation in the vineyards and orchards, for I know that my colleague laments much the persistent use of a light two-furrow plough in the vineyards by so large a proportion of the growers. There has arisen, one knows not how, a dread of damaging roots by deep cultivation, but if good strong winter ploughing had been practised from the first both trees and vines, I believe, would have been more vigorous as a rule, and the dread would have been shown to be a mere bogey. In humid districts without irrigation there is reason in light surface cultivation in summer, but on alkali lands deep cultivation should be the rule, for a mulch or tilth only 1in. or 2in. deep can only tend to increase the impregnation of the top layers of soil with corrosive and deleterious salts compared with a tilth three times that depth or more, and to encourage the roots to the strongly-impregnated top soil.

V. Climate.

Here one touches uncertain ground, and the proof of the pudding is ever in the eating thereof; but it occurs to me as a subject well worth investigation whether the excessive dryness of the air, the high temperature, and more especially the scorching north winds, to which Renmark is exposed, does not shorten the life of the apricot. The water applied in summer, when evaporation is so extremely rapid and the soil so warm, must lead to rapid changes of temperature, and the almost incessantly rapid transpiration of moisture from the leaves may lead to the tree living too fast; but as anything to be said in this relation must be hypothetical, I pass the matter.

The Water Used for Irrigation.—We had two samples taken—No. 1 from where the pump lifts water near the confluence of the Ral Ral Creek with the river; No. 2 from what is known as the reservoir—a natural depression off the river into which No. 1 pump delivers. Mr. Goyder's partial analysis of these samples is as follows:—

No. 1.—Total solids, 19·6grs. per gallon; chlorine, 5·6grs. per gallon, equivalent to 9·2grs. of common salt, magnesium, 1·71grs. per gallon.

No. 2.—Total solids, 16·2grs. per gallon; chlorine, 2·7grs. per gallon, equivalent to 4·4grs. of common salt; magnesium, 1·14grs. per gallon.

There was some question whether the water used was altogether fit for irrigation at certain periods of the year, and therefore samples were taken. I confess I did not anticipate a position such as No. 1 discloses, and only asked Mr. Goyder for a statement of the grains per gallon of sodium and magnesium salts, but I now find that it would have been well to have had the soda salts—sulphate chloride and carbonate—given separately, that definite knowledge of the condition might have been available. Of course, the water varies in purity according to the river level, and one full analysis would not have been sufficient. A sample of the water once per month throughout the year should be examined for full satisfaction. The above samples were taken shortly after midwinter, at which time the river was high enough to be navigable; but with a lower river, when billabongs and backwaters all more or less saline are draining out into it, a more serious state of things might be revealed. On certain lands with good natural drainage water such as No. 1 could be used, for the percentage of salts is considerably under the limit of tolerance, but for lands already alkaline its use should as far as possible be avoided. An application of this water in quantity equal to 4in. of rain would convey to the soil salt to the amount of 1cwt. per acre, and this, it will be recognised, is undesirable for lands with a percentage of alkali approaching the limit of tolerance. It should be used, therefore, only in cases of emergency. Of course, the question generally is only relative, but I may say in America 34grs. to the gallon of soda salts or thereabout is considered the maximum limit in waters to be used for irrigation on average fresh country. Professor Knop, of Leipzig, has stated that water containing more than one per 1,000 (or 70grs. per gallon) of soluble salts brings about in plants a languishing vegetation, and an increase over this amount arrests it altogether.

I know that for special purposes water containing even Knop's maximum has been used and is used, but it could not be used generally. Dr. Voelcker instances a case in India where the *raiyat* preferred well water yielding 71grs. per gallon to the water of the Cawnpore branch of the Lower Ganges Canal, which gave only 15grs. of solid residue per gallon. The well water contained 14·6grs. of common salt, 8·6grs. of nitrate of soda, and 14·4grs. of carbonate of soda (black alkali) per gallon; while in the canal water the common salt and nitrate of soda were absent, and only 2·3grs. of carbonate of soda per gallon was present; but this was for a special purpose, viz., for the growth of tobacco. Still, it shows that the case is indefinite and peculiarly relative. I have indicated sufficiently definitely, I think, that there is very ample justification for extreme caution at Renmark in the use of water straight from No. 1 pump when the river is in the condition described, or worse.

Fortunately, the water in the reservoir is better, but in view of the alkali lands for which it is used one would have liked to have found less salt in it. A total quantity of even this water applied in several waterings equivalent to the total water of 8in. rainfall would carry to the soil, we must remember, about 1cwt. of common salt per acre, besides other salts more or less injurious, and that to soils which cannot suffer much increase generally. Accordingly, every possible opportunity should be taken to flush this reservoir with purer water when it is available. It is desirable also to have regular analyses made of even the reservoir water, that the limits of average variation of its mineral residue may be known, as such knowledge may be applied in some possible modification of the practice of watering. The salt present, 4·4grs. per gallon, would certainly not lead anyone to question the utility of the water for irrigation, and, from the point of view of intelligent management, the limits of variation should be known both for this salt and also the sulphate and carbonate of soda, which I am sorry, in the preconceived notion that the water was above suspicion, I did not have estimated in the sample taken.

Such, to the best of my knowledge, is the position at Renmark in respect to the soils and irrigation water. The outlook on the lines of present practice is not favorable, for unless special antidotes are introduced the use of alkali will continue, and that is the main trouble.

It will be expected that I state what practices I could recommend to ameliorate the conditions, and accordingly I offer the following suggestions:—

1. *That the Use of Gypsum be Continued.*—The landowners, following Californian precedent and the teaching of Professor Hilgard, have already used gypsum extensively, and also in many cases intensively, with a view to the neutralising of the alkaline carbonate of soda. This is well, and no doubt their reward will be similar results to those obtained in California, viz., disappearance largely of this the most injurious of alkali salts. The change brought about is that the sulphate of lime reacts in the presence of moisture with the carbonate of soda and there is formed sulphate of soda and carbonate of lime. It is well to use the gypsum in excess to prevent the re-formation of carbonate of soda and to make sure of reaching the greater part of it present, and the finer the powder and the more evenly it be distributed the more effectively will the change be brought about. The residents using the gypsum of the neighborhood feared that it might contain percentages of salts sufficient to be injurious. A sample, taken from a heap about to be distributed on one of the blocks, showed the following composition:—

Gypsum	92·27 per cent.
Sodium chloride	0·34 "
Water soluble magnesium	0·17 "

This is a very good quality gypsum, and no danger can accrue even from its use in great excess while the composition is approximately that represented, but it would be well to have analysis of samples from the deposit taken occasionally, as it will very probably vary considerably and it might be desirable to avoid parts of it.

I found that some of the settlers were applying abnormally heavy dressings—as much as 12 tons per acre. This was really extravagant work, for in the knowledge that Loughbridge, after investigation, recommends that twice the theoretical amount necessary should be used, I found no instance where even half 12 tons was required. It would be better to have applied much less than the above amount, and in successive dressings. In In its agricultural effects gypsum is is ever best applied in frequent small dressings rather than in less frequent heavy doses; and in the Renmark cases I would set down from 5cwts. to 1 ton per acre as most generally useful, with at most 2 tons for extreme cases, and follow this up with 2cwts. or 3cwts. per acre for a year or two.

Gypsum will open and ameliorate the stiffer soils, and, indeed, has done so wonderfully; and it will tend to disintegrate the hard pan and allow of the percolation of water to greater depths.

It has been shown in San Isaquin to be a good plan to sprinkle gypsum in the bottom of the hole in which a tree is to be planted, and to mix gypsum—a few pounds—with the soil and around the collar of the tree when planting.

2. *That Frequent and Deep Tillage be Practised.*—Gypsum, while it changes the carbonate of soda to sulphate of soda, is not effective against common salt. Where all three salts are present, as they appear to be in all the worst spots at least, the use of gypsum increases the percentage of sulphate of soda, and the common salt remains as before. In the table of analyses given, No. 5 shows most of the salts to be at the surface, and in the summer time, when evaporation is rapid, this will be more evident. Deep ploughing turns this saline layer down and mixes it with the soil; it gives a deeper mulch to the land and prevents the deposit from evaporation accumulating on the surface; it tends to make the roots seek down away from the more saline surface and to a part of the soil less exposed to rapid changes of temperature; and it renders less water necessary, as it lessens the rate of evaporation. The endeavor of the owner of an orchard at Renmark should, I think, be towards a tilth of half a foot of free pulverised soil.

3. *Heavier Winter Irrigation*, more especially if the block can be under-drained. In present conditions there is much danger of waterlogging if this were practised, but with deep cultivation the danger is less, and with under-drainage it does not prevail. Where such winter irrigation is adopted constant deep working or stirring of the land is the more necessary in summer time to keep the water down and the salts in solution through it. If to obtain this it be necessary to use the water of the river or from the reservoir when it is less fit for irrigation, of course the recommendation does not apply.

4. *Under-drainage.*—I almost hesitate, in view of the financial position of the settlement, to mention this amendment, but as I believe it to be a reliable panacea for the troubles in the soil I advance the suggestion. In the orchards of this colony drainage has been up to date almost utterly neglected, but, dry though the summer be, I have a notion that were the orchards in moister districts at least well under-drained we should hear less—much less—of the corruption of blights and rots and have fewer diseases in our orchards, with longer life and more vigor in our trees and heavier yields all round. Further, we would hear less of the evil effects of summer droughts if under-drainage was associated with deep winter cultivation, as the trees would live more from the deeper layers of the soil. In respect to Renmark, however, the under-drainage is necessitated as the only means of taking off for ever the salts now causing trouble. Fruit culture and viticulture are not my interests, and accordingly I am not *au fait* of the economics of these industries, but I venture the suggestion that it will pay better at Renmark to adopt under-drainage than to carry on without it. On some of the blocks now occupied it is not, it seems to me, a question whether the additional outlay will be a means of recovering on the whole capital account, but rather will it be a means of avoiding the loss of the whole of the capital while paying for the additional outlay, for I cannot see that some of the blocks can possibly succeed without under-drainage. Gypsum, deep cultivation, manuring, and possibly more winter irrigation will no doubt do much good in the present position, but unless under-drainage can be added the fatal day, I fear, is but postponed. I would not go so far as to say that under-drainage is necessary for the whole of the settlement; the pine and sandalwood rising grounds may not need it, but the greater part of the settlement is crying out for good under-drainage. As a general statement I would say that all the mallee land and the box land, as well as the land which naturally was bare or carrying only saltbush and such like, stands in need of drainage. From the first this amendment should have been considered the complement of irrigation. The advantages of drainage are so many and so important that I am assured it will pay better to adopt it than to endeavor to go on without it: and for orchards where the total return per acre is relatively large the cost is dwarfed.

I will say, then, that if a drainage system with, say, 2in. tiles and corresponding main tiles can be put down the anxiety of the Renmark owners relative to their soils will be at at end.

5. The application of manures, nitrogenous and phosphatic, on the higher levels more necessarily, or where practicable the ploughing in of green manure crops dressed with phosphates.

6. In the absence of drainage the growth of crops between the rows of trees (1) to shade the land and lessen evaporation; (2) to draw water from below, and so loosen the deposition of salt at the surface; and (3) to carry off part at least of the accumulating soluble salts.

The difficulty here is the marketing or utilisation of the crops when grown, and also the selection of crops suitable. Among those best adapted to withstand salt may be mentioned wheat, barley, mangolds, and sugar beets, asparagus, celery, horseradish, tomatoes, onions, and the cabbage family.

I believe the influence of such crops growing to be well worth the investigation, on a small scale at least, of those concerned, but I lay no great stress on this last suggestion, for the owners will know more of the economics of the case than I can do.

ANALYSIS OF COMMERCIAL FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

During the past month several thousands of tons of mineral superphosphate have arrived at Port Adelaide, and large quantities are expected during this and the next two months. There is every indication that last year's importations will be very largely exceeded during the current year. The continued large importations of seed drills also bears evidence of the extension of the practice of putting in the seed and manure together.

The following additional analyses of samples taken by myself have been received from the Agricultural Analyst since previous issue:—

Bone and Mixed Fertilisers.

Name of Vendor and Manure.	Water Soluble Phosphate.		Citrate Soluble Phosphate.		Acid Soluble Phosphate.		Nitrogen.		Potash.		Price per Ton.
	Vendor's Guarantee.	Analysis by Agricultural Analyst.	Vendor's Guarantee.	Analysis by Agricultural Analyst.	Vendor's Guarantee.	Analysis by Agricultural Analyst.	Vendor's Guarantee.	Analysis by Agricultural Analyst.	Vendor's Guarantee.	Analysis by Agricultural Analyst.	
	%	%	%	%	%	%	%	%	%	%	£ s. d.
E. & W. Hackett—											
Sugar Co. Super. No. 1 ..	35	28·81	—	8·29	—	—	—	—	—	—	5 10 0
" " No. 2 ..	33	33·8	—	—	—	—	1·64	1·68	1	1·02	6 10 0
" " No. 3 ..	28	31·65	—	—	—	—	3·29	3·26	2	1·95	7 10 0
" " No. 4 ..	24	28·37	—	—	—	—	4·94	4·76	4	3·98	8 10 0
Adelaide Chemical Works—											
Bone Super.	16·05	14·6	15·1	16·7	5·9	7·5	3·2	3·05	0·25	0·24	5 5 0
Guano Super.	12·7	18·12	20·09	14·62	3·1	2·85	1·07	1·05	—	—	3 15 0
E. & W. Hackett—											
Trotter Manure	—	—	—	—	31	25·97	1·25	6·97	—	—	5 0 0
Bone Phosphate	—	—	—	—	60	65·49	0·5	0·56	—	—	4 15 0
Clutterbuck Bros.—											
Guano Super.	—	trace	—	14·6	—	—	—	—	—	—	—

The sample of trotter manure obtained from Messrs. E. & W. Hackett is unusually high in nitrogen, in fact too high for the sample to have been a fair average of what the fertiliser usually is, as the guaranteed analysis shows. It is the by-product of the glue works, and being made up in small lots is very liable to variation. The sample in question was of a very "gluey" nature, which probably accounts for the high percentage of nitrogen.

Messrs. Hackett advised me on receipt of statement of analysis of Sugar Company No. 1 super. that it was so much below the analysis on which they purchased it they had withdrawn it from sale. The high percentage of citrate soluble phosphate suggests that the deficiency has been caused by reversion of portion of the water soluble phosphate. Messrs. Clutterbuck Bros. advise that the so-called guano super. was obtained by them from Mr. R. D. Vawser, Excelsior Manure Company, Cheltenham, and that it will not be offered for sale as guano super.

Mineral Superphosphate.

Vendor.	Brand.	Analysis.
Adelaide Chemical Works—Average of two shipments	American Super	33·07 per cent. water soluble phosphate. 4·6 per cent. citrate soluble phosphate.
Clutterbuck Brothers	Special	41·6 per cent. water soluble phosphate.
Clutterbuck Brothers	United Alkali Co.	36·97 " " "
Geo. Wills & Co.............	do	36·97 " " "
S.A. Farmers' Co-operative Union	do	36·97 " " "
Elder, Smith, & Co...........	Lawes	38·6 " " "
Australasian Implement Co. ..	do	38·4 " " "

Sulphate of ammonia from South Australian Gas Company, 25·67 per cent. ammonia.
Australian potash, from E. & W. Hackett, 24·9 per cent. potash.

Most of the mineral superphosphate that comes to this colony is of European manufacture, but fairly large parcels are being imported from Sydney and New York. The usual quality is 36 per cent. to 38 per cent. water soluble phosphate, but the Americans use the term "available" phosphate, which covers both water soluble and citrate soluble phosphate, and purchasers should bear this in mind when ordering their supplies. Most of the English super. contains 2 per cent. to 3 per cent. of citrate soluble phosphate in addition to the water soluble phosphate, but this is rarely taken into account in the guarantee. In the samples referred to above Clutterbuck's special super. contained 2 per cent. and the United Alkali super. 3·27 per cent. of citrate soluble phosphate.

Farmers who have used manures unsuitable to their climatic and soil conditions, and have not obtained the extra returns expected, are usually disposed to blame the manure, and some have inquired whether the analyses published in the *Journal* are representative of the manures actually sold. As each sample for analysis is taken from eight to twenty different bags as they lay in the hold of the vessel, on the wharf, or in the store, as the case may be, and every care is taken to thoroughly mix the lot, there can be no doubt that, with the imported manure especially, these analyses may be depended on. With small parcels of local make, and especially by-products of other manufactures, there is always a liability to some variation, as in the case of the trotter manure previously referred to, and such lines are more frequently sampled in order to prevent anything below the guaranteed analysis being disposed of.

THE SEASON'S WORK AT ROSEWORTHY COLLEGE FARM.

By W. Lowrie, M.A., B.Sc.

On the land known as Nottle's, purchased in 1898 in extension of the College Farm, a series of parallel plots were arranged in demonstration of the utility of various artificial manures The land had been frequently cropped with wheat through a long number of years, but the wheat had been taken after bare fallow and without artificial manures. The land therefore was typically wheat-exhausted, and afforded good opportunity to show the efficacy of the various artificial dressings The soil varies from light sandy to open light limestone brash, such as often prevails in mallee country, and the variations run transversely across the area, 50 chains in length, devoted to the plots. The yields are light, but the season's rainfall does not altogether account for this, low though it was. The seed time was exceptionally unsatisfactory, and the surface soil was so open and free that in spite of precautions much of the seed went in too deeply for the after weather conditions to enable it to come through well. A proportion of it malted, and consequently the plant came up too thinly for this district.

The rainfall for the year was 14·8in., and of that amount 3·9in. fell before the end of March.

The following are the results:—

Manure Demonstration Plots.

No.	Area.	Date of Sowing.	Manure.	Quantity per Acre.	Per Acre Yield.		Per acre Increase due to Manure.	
	Acres.	May.		Cwts.	bush.	lbs.	bush.	lbs.
1	2½	9	Lake Fowler Company	2	11	27	3	47
2	1	10	Guano (Wills & Co.)	2	10	16	2	29
3	1¼	10	Unmanured	Nil	7	47	—	
4	2½	10	Basic slag (F. H. Snow)	2	15	3	7	16
5	2½	10	Basic slag (F. H. Snow) Nitrate of soda (F. H. Snow)	2 1	15	28	7	41
6	2½	10	Basic slag (F. H. Snow) Muriate of potash (F. H. Snow)	2 1	15	55	8	8
7	2½	10	Unmanured	Nil	6	17	—	
8	2½	10	Basic slag (F. H. Snow) Nitrate of soda (F. H. Snow) Muriate of potash (F. H. Snow)	2 1 1	13	49	7	32
9	5	11	Ohlendorff's dissolved guano (Gibbs, Bright, & Co.)	2	19	55	13	38
10	5	11	Bonedust (Anders)	2	7	11	0	54
11	5	11	Bone char (Hackett)	2	5	44	Nil	
12	5	11	Lawes' superphosphate (Elder, Smith & Co.	2	18	53	12	36
13	5	11	Lawes' superphosphate Bone char	1 1	15	22	9	1
14	5	12	Lawes' superphosphate Bonedust	1 1	15	30	9	9
15	1¼	12	Unmanured	—	6	21	—	
16	2½	12	Lawes' superphosphate (Elder, Smith & Co.)	1	14	48	8	27
17	1¼	12	Lawes' superphosphate Sulphate of ammonia	2 ¾	19	4	12	43

Thus during the past season bone char, or bone phosphate as it was called, had no effect whatever in increasing the yield on this land. When added to superphosphate it gave a gain of only a few pounds per acre. Of course the manure is not lost, as it will become available in the course of time for succeeding crops, but it is not immediately remunerative as some of the other manures of the list. The mixing of bone char or bonedust with superphosphate I do not recommend, but a plot was treated with the mixture to demonstrate to farmers visiting the farm that the practice is not good, and that the same value applied as superphosphate alone is more remunerative. Many farmers regularly sow such mixtures, but I believe parallel tests as above on their lands would convince most of them that the money—even taking residual values into account—can be better spent. In this case the gain in favor of using superphosphate alone was approximately 8s. per acre (wheat at 2s. 6d.) more than that from the same value expended on the mixture. With a heavier rainfall the difference would no doubt be less marked; but I cannot think that the mixing is ever to be recommended.

These results confirm the opinions once more which have been so often urged from this institution—(1) That for our conditions superphosphate of one kind or another is the most profitable artificial manure. (2) That 2cwts. per acre is to be recommended in preference to 1cwt. per acre for the first few years at least of its use. In this case, taking wheat at 2s. 6d. per bushel, the comparative results of the use of 2cwts. superphosphate and 1cwt respectively, are as follows:—

A—2cwts. per acre—	£	s.	d.
Value of increased yield (12bush. 36lbs.), at 2s. 6d.	1	11	6
Cost of manure in Adelaide, 2cwts., at 4s. 3d.	0	8	6
Net gain per acre	£1	3	0

B—1cwt. per acre—	£	s.	d.
Value of increased yield (8bush. 27lbs.), at 2s. 6d.	1	1	1½
Cost of manure in Adelaide, 1cwt., at 4s. 3d.	0	4	3
Net gain per acre	£0	16	10½

The first hundredweight no doubt pays better proportionally to the outlay, but the gain on the second hundredweight is 28 per cent. of the amount expended, which is surely good business.

(3) That nitrogenous and potassic manures, for the first few years at least, are unprofitable. In the cases of plots 8 and 4 it will be seen that nitrate of soda and muriate of potash, added to basic slag, gave less than basic slag alone, although when one at a time of these manures was added to basic slag there was a few pounds of wheat per acre increase, yet not sufficient to repay the cost in either case of the nitrate of soda or muriate of potash. Similar results will not of course follow in all soils—that goes without saying, but I believe these figures indicate the average trend, especially on mallee lands. On plot 8 the heavy additions of nitrate of soda and muriate of potash in presence of the low percentage of moisture in the soil lessened the percentage of germination. This of course arose from the fact that the crystals of the salt absorbed moisture from the immediately surrounding soil and dissolving therein gave in these spots a solution too concentrated for healthy germination of adjacent grain, and further left the soil surrounding other grains in the coulter furrow too dry.

Weeds on Paths.—These may be destroyed without breaking up the paths by treating with hot brine—1lb. salt to 1gall. water; or one part sulphuric acid to thirty parts water; or 1oz. carbolic acid to 1gall. of water; or 1lb. powdered arsenic in 10galls. water. To dissolve the arsenic place it in 3galls. cold water, bring up to boil and keep stirring, then while boiling add 7galls. water and 2lbs. washing soda.

FARM HINTS FOR FEBRUARY.

By the Editor.

Even a few acres of green fodder will be of great value when all other feed is dry and perhaps beaten down and destroyed by early rains. In some places on nearly every farm it is possible to break up some land or to make use of fallowed soil for this purpose. Put on as much farmyard manure as can be spared, harrow the soil down well, and towards the end of this month sow a mixture of barley, mustard, and rape, or some tares or oats in substitution for any one of the others; these will come on rapidly after the first rains.

In selecting seed wheat care must be taken that it is the very best for the locality, perfectly free from ear-cockle, drake, and other pests and weeds, and clean from bunt and smut. It is never safe to sow seed without pickling it, and the seed should be thrown loose into the pickle or placed in a perforated wire basket, so that the bunt balls may float on the surface and be removed. If the seed is steeped in bags or laid on the floor and sprinkled with the bluestone solution the bunt balls remain with the seed, and when passing through the force-feed of the drill or through the discs of the broadcast seedsower they are crushed, the spores of the bunt are not sterilised in the pickling, and the seed is reinfected with bunt. If sown in dry soil the very small quantity of moisture in it may cause the bunt spores to start growing, and they are starved before the wheat starts to grow; but if the soil is damp enough to germinate the wheat then the bunt starts at the same time and has a host to live upon, so that the crop becomes bunted or "smutty."

Prepare land thoroughly for sowing grasses, clovers, or lucerne early next month. Deep tilth and plenty of manure will give heavy crops. For lucerne the soil must be worked down as if it were intended for onion beds The seed should be drilled in ½in. deep, and the land ought to be rolled at once after being seeded. When the plants are forward enough a good heavy harrowing will benefit the crop.

When selecting seeds of any kind of cereal be sure that the sample is perfectly clean, free from bunt or smut, and all of one sort. If two or three kinds of seed are mixed one sort may ripen earlier than another, or be shorter in the straw, and trouble and loss will be caused.

It is to be hoped that paint and oil were used on wood and iron of implements and tools put away last season, and that all necessary repairs were made at the time. The machinists and smiths are generally very busy at seeding and harvesting time, making repairs to implements which ought to be at work in the fields, but which were put away in a state of disrepair. It is right to put everything under shelter, but it is wrong to let the poultry roost upon the machines and implements. The fowl manure will do more good on the garden than in the farm wagon or on the reaper and binder.

A liberal dressing of super. or Thomas phosphate on grass lands will prove beneficial, and if a good lot of farmyard manure can be also spread it will be all the better. Fresh stable or cowyard manure spread at once upon fields or paddocks will do much more good than if kept until it is reduced to one-half its weight and one-fourth of its original fertilising value by the process of "making." The only objection, and that is a serious one, to new manure is in the seeds of foreign weeds contained in it, but this would hardly be worth consideration in connection with a grass paddock.

Make a rich bed of sandy loam and sow some Jersey tree kail or some thousand-headed kail in it. Cover the seeds less than ½in. and keep the bed moist and shaded from the direct sun rays by means of a sheet of scrim or cheesecloth. The plants will be ready by the time the first heavy rains come, and a field should be prepared by thorough tillage and heavy manuring for those plants which will have to be put in rows 5ft. or 6ft. apart, with 3ft. between the plants. The leaves only are pulled off and carried to the cattle.

There are some sheep which give much more and better wool than other sheep, and yet the latter eat as much and are as costly to manage as the better class of animals. The wise farmer will try to get the better class, and if he feels that some other man is a better judge than himself in this matter he will seek his advice and assistance, even if he has to pay for it. It does not pay to keep sheep until they have lost all their teeth, but it does pay to keep all the best of the young animals, to buy good rams and ewes, and to cull out and use or sell the poorer class of animals. Above all, sheep must be well fed.

For the live stock an attempt should be made to grow crops of peas, tares or vetches, swedes, turnips, kail, kohlrabi, beets, mangolds, and other similar cattle foods at various seasons. They all require some of the best land in the best positions, and that land must be thoroughly well prepared and manured as liberally as means can afford ; but they will pay to grow, and can be profitably used, together with a good quantity of straw. Some of the land should also be set apart for the growth of ensilage crops, and it will be found that the greater the variety of wholesome plants there is in the silage the more nutritious and the better liked by the stock will the ensilage be.

If the subsoil is broken up dry it is liable to remain in a cloddy or lumpy condition for a long time, and therefore it keeps dry, or the moisture rapidly evaporates. The consequence is that the crop grown upon that land perishes in patches for want of sufficient moisture, and some farmers call this "takeall." Deep pulverisation is very beneficial to all crops, but the subsoil must not be brought on to the surface.

Frequent shallow cultivation amongst crops of all kinds is very beneficial, but it is absolutely necessary in the case of summer and autumn green fodder crops, such as sorghums, holcus, kails, beets, mangolds, &c.

POULTRY NOTES.

By D. F. Laurie.

It seems that one must traverse old ground and statements, at any rate as regards breeds. Hitherto I have endeavored to point out those varieties of poultry which have stood the most rigid tests. For all that has been said it is evident that but little is generally known of the economic side of poultry-keeping. Whether eggs or meat is our goal we wish to know what breed are indicated as the most satisfactory and what methods the most profitable.

In giving an account of various breeds of utility poultry I have set before the reader their salient virtues and have endeavored not to accentuate those of any one breed. In this respect many good fanciers fail; they become too enamored of their particular "fancy," and they run it for all it is worth. Environment and general attention to evident wants have much more to do with the welfare of poultry than mere mechanical action as regards feeding, housing, &c. It is of no practical value to state the results of certain operations if full details are not supplied.

This article might be well divided into different sections, with a view of showing the foolish practices which are commonly to be met with. I will briefly summarise the requirements of the various classes of poultry.

Laying Hens.

These should be the progeny of carefully-selected parents, bred on each side from known layers. Laying is to a great extent a matter of strain, not of breed. However, we find that provision has been made in this respect, for we have the laying breeds to select from. What are these laying breeds? Well, they are breeds the hens and pullets of which have long enjoyed a reputation for great laying powers. To enumerate them again, for the benefit of unenlightened readers we can place the layers as follows:—The Minorca, of which we know the black and the white; the Andalusian, similar to the old time blue Spanish: the Leghorn, of which we find the following sub-varieties—the white, brown, black, buff, pile, duckwing, &c.; the Hamburgh, in five varieties, as the black, gold and silver spangled, gold and silver pencilled. The order of quantity and weight of eggs is approximately as stated. These breeds are celebrated as layers, but it must always be remembered that laying is a matter of strain more than breed.

All-round Fowls.

Again we come to a question that is ancient in appearance, modern in use, that is, what is a good all-round fowl? Anyone who studies the subject can at once see that a high percentage of eggs in conjunction with quality of flesh are virtues that go not hand in hand. The very effort requisite to produce all the numerous constituents of the egg will prove that no appreciable balance can be left for the production of succulent flesh; the result must be hard muscle. Truly there are hens which under varying circumstances have gained the name of the "all-round fowl." Now the up-to-date practical producer does not want a second-rate bird; he doubtless has made up his mind as to his actual requirements. The following breeds are generally classified as "all-round fowls," but it must not be forgotten that the laying powers or the adaptability to put on flesh can be assisted. The most popular of these breeds is the Orpington, a good layer, and a good table bird; another is the Wyandotte. Both breeds have several sub-varieties. These breeds are highly recommended as typical "farmers' fowls," because the hens are good layers. and the young birds, if the sexes are separated, and if well fed, make excellent table birds. They are valuable also for crossings. The Langshan has a great reputation, both as a layer and as a table bird; if the cockerels, either pure or crossed with Indian Game, are kept from the hens and well fed they grow into enormous birds, and are equal in quality to the much-vaunted capon. Separation of the sexes is most important.

Table Fowls.

For table-fowl breeding we have, in addition to the all-round breeds just mentioned, the Dorking, Indian Game, and Old English Game, none of which have special claim as layers. As regards egg production, the aim should be to secure a good yield during the scarce season, and in cold weather. To do this a succession of hatchings must be made, and more than one variety may be kept, as some lay better than others in cold weather. Therefore, in purchasing poultry, the feature must be the utility, in preference to the fancy; but it is useless to purchase high-priced crossbreds. Several people have essayed to found laying strains, so as to sell the eggs and progeny as such; but in all the cases I have inquired into the good intentions have failed through the fault of the breeder. You cannot learn all the secrets of breeding from a couple of years' experience without the help of the information supplied by experienced and well-informed breeders. Writers do not go to the trouble of imparting any but practical information.

Salt for Cows.—One of the uses of giving cows salt, especially in hot weather, is that it acts as a preservative in the system. Everyone accustomed to test milk can tell by its flavor whether the cows have been getting their salt. There is no doubt whatever that the neglect of "salting the cows" spoils the butter and injures the milk for the cheese factory.

NOTES ON VEGETABLE-GROWING FOR FEBRUARY.

By George Quinn, Horticultural Instructor.

Final sowings of dwarf beans will be made during this month. If put in later there are many chances against pods being formed in sufficient quantities to compensate for the labor.

An early sowing of peas will be made in the warm open plains country. To obtain the best results stable manure should be used liberally in mulching over the drills, and abundance of water must be given. In a small way I have always secured good results from the well-known ' Yorkshire Hero " variety sown in February. Owing to the dryness of the atmosphere during this and next month peas are apt to become scorched and stunted, but if watered by means of sprinklers or perforated pipes this may be largely overcome.

In most localities the sparrows are very destructive among pea plants as they emerge from the soil; and no plan short of complete netting over gives such uniform results as a single thread of black cotton stretched along the drills about 2in. above the ground surface. The wily sparrow seems to suspect a snare and does not venture too near to the threads.

Sowings in prepared beds should be made of cabbage, cauliflower, celery, lettuce, kohlrabi. These seed beds should be lightly mulched with pulverised manure and kept moderately moist. Calico or lath covers are preferable to glass, obviating the danger from scorching, which may arise from a slight neglect to shade during a sunny day. In raising seedlings thus it is advisable after the rough leaves appear to thin out the plants, allowing such space above the surface as will enable the foliage of each one to grow up sturdily, and the root system to be somewhat separate. This facilitates the work of transplanting and lessens the chances of the plants receiving a severe check or perhaps a a large proportion being killed in the operation. In growing early plants of the cabbage family these precautions have a more far-reaching effect upon the plant's future development than is at first apparent.

One very important advantage held by a sturdy vigorous plant is its comparative immunity from the attacks of the destructive cabbage aphis, or blight, which is often the most serious drawback to the successful production of early cabbage, cauliflowers, &c.

As the month progresses sowings outdoors should be made of carrots, parsnips, white and swede turnips, and prickly spinach. These should be drilled in so that the hoe may be used freely in stirring the soil between the rows. This will conserve moisture and promote a continuous healthy root action.

Vegetable-growers, whether in an amateur or professional capacity, should avoid as far as possible raising crops of the same vegetables two years in succession upon the same ground. This not only checks the drain upon certain plant foods in those particular plots, but has a most important bearing upon the counteracting of insect or fungus pests, and the physical action of the roots or different practices of cultivation applied to various crops must also have an influence upon the soil.

Salad plants should be sown still in shady places, as much hot weather must yet be anticipated. The harvesting of onions and potatoes will still be in hand, and the latter should be carefully sheltered to prevent potato moths depositing eggs upon them. All of the members of the melon family require abundance of water. Those of the pumpkin section undoubtedly thrive best under the "shower" method of distributing it by sprinklers of a design appropriate to the magnitude of the area under crop. Cut marrows, especially of the "bush" varieties, before they become fully developed or the plants stop blooming; in fact, with all of the cucurbitaceous plants, the fruits of which are used in the green stage either raw or cooked, this plan will secure the largest yield. Tomatoes require plenty of water and ripe fruits should be regularly gathered. For transmission over long distances these fruits should be gathered when on the turn in color, and not red or yellow all over.

All fruits affected by rot fungus or caterpillars should be thrown into a furnace to destroy the larvæ and spores.

In the cool elevated districts the gullies will be planted with cabbage and cauliflower plants, while young crops of turnip, carrot, and parsnip will require thinning.

Beans, both of dwarf and runner kinds, will require abundance of water and careful picking to avoid the maturing of seeds in the pods.

Only where asparagus plants are still green and growing liberal supplies of water will be welcome, but yellow stalks showing red ripened seeds must be cut away if the nuisance of young self-sown plants in the bed would be avoided.

ORCHARD NOTES FOR FEBRUARY.

By George Quinn, Horticultural Instructor.

The harvesting of crops is the main occupation of the fruitgrower just now. Any operations performed during the past season with a view to improving the quantity or quality of the same should be reviewed and the results noted for future guidance. Thinning off fruits, either by actually plucking away the partly developed specimens or by pruning out fruit-bearing wood, should now show advantages or disadvantages, according to the correctness of the method or time when performed. Knowing the cultural treatment the trees have received, and the climatic conditions which have prevailed, the experimenter should be in a position to form some idea of the value of any new work thus undertaken.

The crops of apples are very disappointing this season in many parts, and the prevalence of "scab" (Fusicladium) will render the sample below the average of past years.

Growers are already complaining of their own neglect to spray with Bordeaux mixture, and expressing determination not to be caught napping again. Others who have sprayed in winter complain of the presence of the disease more than usual, and blame the showery spring for producing conditions suitable for the rapid development of the fungus.

The harvesting of apples and pears will be under way, though doubtless next month will see the late-keeping varieties more in hand.

Apples should be harvested when they separate readily from the spur or when the seeds turn brown. To avoid early "mealiness" in some well-flavored kinds the former guide is the best to follow. The export season opens late in February, and exporters will act wisely in only gathering the most advanced specimens on the trees. The fruits should be dry, and excessive moisture must be evaporated from the skins by allowing the fruits to stand a day or two in a shady place before being wrapped and finally packed for transhipment.

The market for apples in London should prove remunerative this season, as the American importations have not been sufficiently large to surfeit the British public, and the crops in Canada and the States are not reported to have been heavy enough to prolong their exporting season far into that period when our earlier shipments arrive in London.

Owing to the prohibitions of the neighboring colonies on apples affected by "Fusicladium" the quantities of first-class fruit available for oversea export will be somewhat restricted this season when intercolonial wants are satisfied.

For local distribution there is a growing tendency among our orchadists to harvest apples prematurely, and much fruit too immature for consumption, even when cooked, has been sold this season. Whether it is fear of infestation by codlin larvæ if allowed to remain on the trees until mature or the inquiries of the dealers for apples owing to the scarcity of other fruits, I am unable to say, but the practice is not calculated to improve the sales of this fruit in future.

The drying of Muscatel, currant, and Sultana grapes will soon be under way, and care should be taken that these be absolutely ripe before being cut for this purpose. In fact high authorities agree that it is better to err on the side of over-ripeness. From Sultanas the best sample of dried fruit is obtained by allowing them to hang upon the vines nearly a fortnight after they become pleasantly palatable.

The budding of young stocks in the nursery or older trees in the orchard should be performed now, and as these buds will remain dormant the growth of the stock above the inserted bud should not be cut away now, but left till the period of winter pruning.

Allow me to repeat a warning against using buds taken from an unfruitful tree. It is also unwise to work from a named tree which has not arrived at a fruiting age.

Buds put in previously should be examined to note their condition, and when a good union has taken place the "ties" can be slackened away or wholly removed, accordingly as progress is noted.

The irrigating of fruit trees, more especially those of the citrus family, requires attention.

These trees should not be permitted to show signs of distress. If allowed to become dry the young fruits will almost inevitably fall from the trees in large numbers.

Loquats also require to be well supplied with water to enable them to produce their flower-bearing shoots later on.

In dry localities stone fruits will develop and mature their flower buds for next spring much better if given a good watering after the fruits are harvested, but it is not well to over-stimulate them into the production of twigs or spurs which will not harden. In this matter a knowledge of local conditions is of the utmost value.

In late districts the fracturing of long laterals upon young vigorous apple and pear trees should be performed some time during this month, for the purpose of transforming them into spurs.

Orchardists having apple or pear trees infested with codlin moth should pay careful attention to the bandages, examining them and destroying the caterpillars refuging there once each week. The fallen infested fruits should also be collected frequently, and either destroyed wholly or treated in such a way as will kill any caterpillars inside of them prior to feeding the fruits to stock or using them in any way. All stakes or other things likely to give refuge to the caterpillars should be removed as soon as possible, and the soil beneath the trees should be kept finely pulverised to prevent the insects being sheltered under any clods.

Before storing apples or pears they should be carefully examined and sorted, and the storeroom should be made so that no escape of moths can take place later on. It is only by circumventing this pest at every known period of its life history that its subjection can in the future be made possible.

FRUIT TREE PRUNING.

No. 9.—By Geo. Quinn, Horticultural Instructor.

Pruning Evergreen Trees.

In South Australia the members of the citrus family and the Loquat include pretty well all of the fruits of any commercial value to be dealt with under this heading.

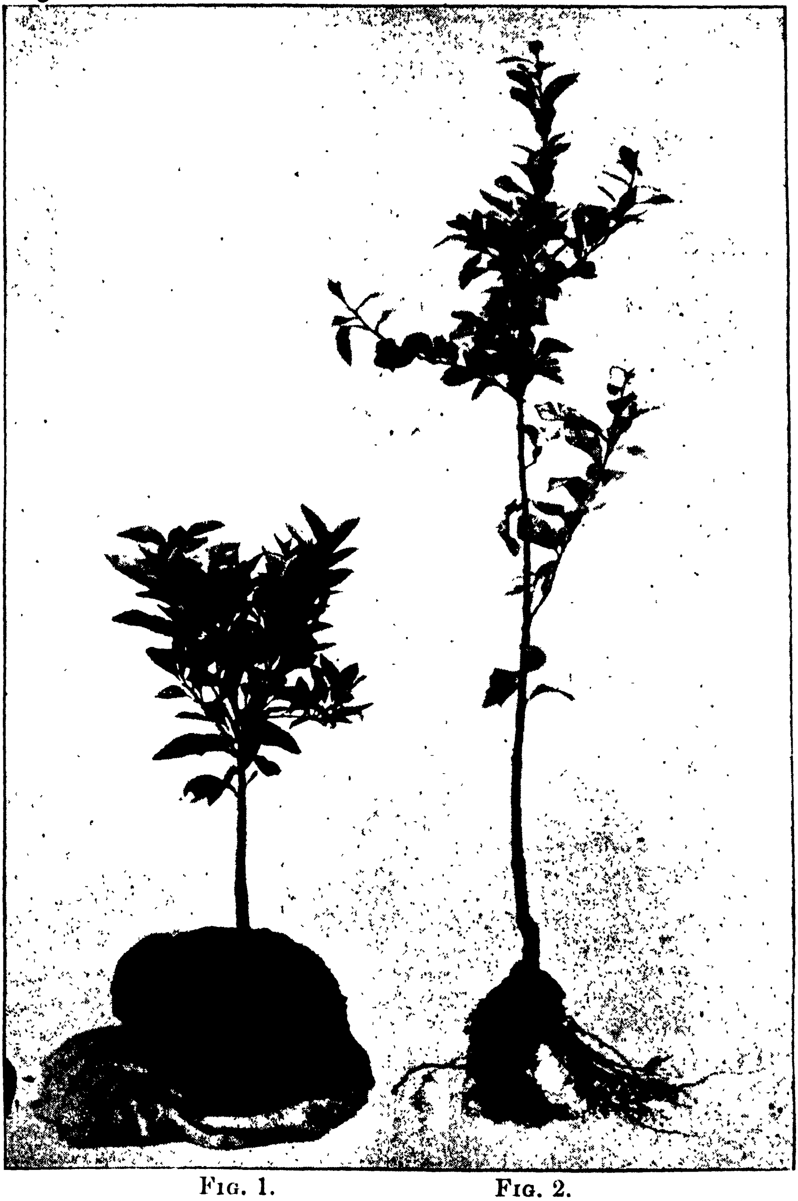

Fig. 1. Fig. 2.

Plate CII.—Types of Young Orange and Lemon Trees.

The principal pruning operations applied to deciduous trees are performed during the winter or dormant season.

The pruning of evergreen trees is chiefly carried into effect when the sap is fairly active, in early springtime.

Citrus Trees.

The members of this family do not, in the ordinary sense, naturally take the form of a tree, but could be more aptly described as a large arborescent shrub. Unlike trees, which raise their branches on lengthy trunks, thus exposing their bark to strong sunlight and other effects of weather, these trees do not produce thick coverings of bark to act as protectors of the tender sap wood beneath. If left in a state of nature pendulous branches spread upon or close to the ground, affording shade and shelter to the bark and the soil surface above the roots.

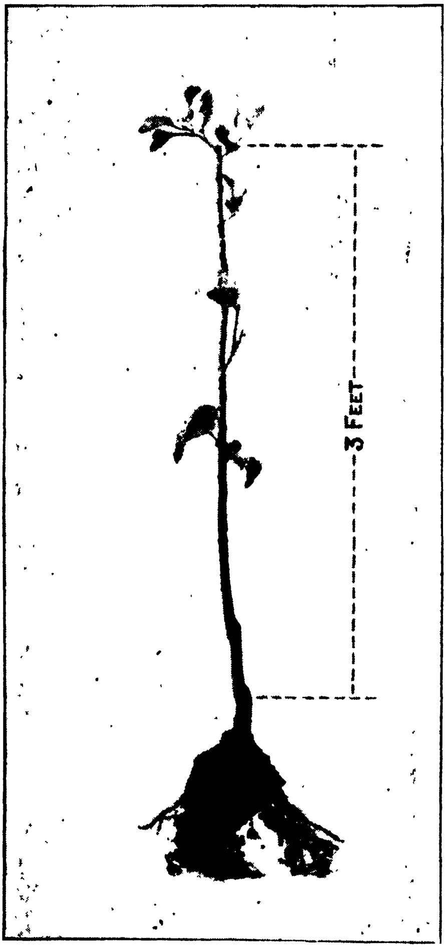

Plate CIII.—Tree Pruned for Planting.

In the manipulation of these trees it is advisable to note these characteristics, although modifications of the natural form must be attempted to permit of various cultural operations being expeditiously performed. The shaping of a citrus tree should begin in the nursery, but unless great care is exercised in shifting the tree into its permanent position very little good will accrue therefrom owing to a damaged root system causing a proportionate reduction in the branches.

In Plate CII., Fig. 1, is shown a young citrus tree (orange) which has been lifted from the nursery without any appreciable injury to the root system. This tree has been formed in the nursery. The central shoot has been nipped out and several branches have arisen from a main stem not much above a foot in length.

This tree on being set out into the orangery would continue to grow, and has the foundation of a good shapely tree in future. Where citrus trees can be lifted in this harmless manner, the advantages of pruning to shape them while still in the nursery bed are indisputable.

Fig. 2, in the same plate, shows another citrus tree (lemon) as they are usually received from the nursery. This tree has had its roots much mangled and reduced by the spade in being lifted. Its top is about 4ft. 6in. high. In Plate CIII. this tree is shown as reduced by pruning to a length of 3ft. A few leaves are left on to assist in restarting the almost suspended vegetative functions, otherwise this tree could have been pruned back to a shorter stem.

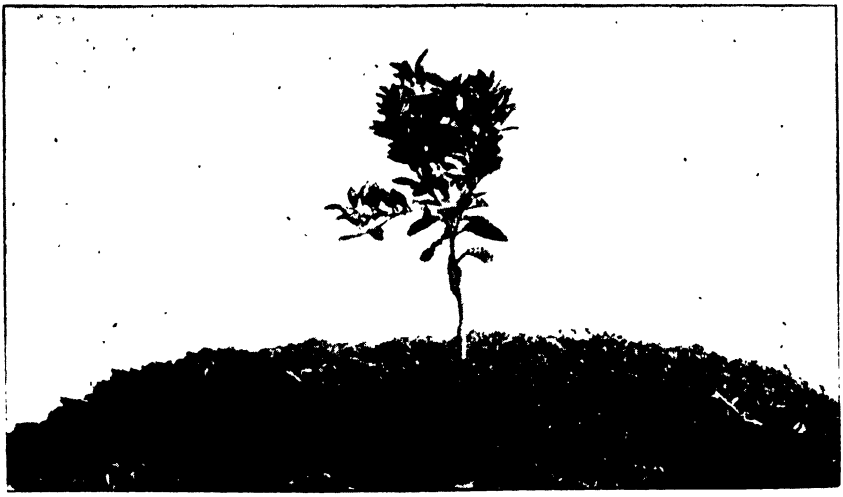

PLATE CIV.—TREE SHORTENED BACK WHEN LOWER BRANCHES HAVE DEVELOPED.

PLATE CV.—FAIR TYPE OF YOUNG ORANGE TREE TWO YEARS PLANTED.

It might be incidentally mentioned here that all trees treated thus should either be shaded by straw or sacking to prevent sunscalding, otherwise the neglect of this precaution may cause the pruning suggested herein to be only labor wasted.

Usually when pruned back in this manner a citrus tree will throw out the strongest shoots on the lower half of the stem, and in Plate CIV. a tree is shown illustrating how, when this upper portion of the stem has been removed a little later on, the tree may be made to assume a good shape.

Having reached this stage of development, with the main arms of the tree clearly defined, beyond taking out any branches which awkwardly cross others properly located no pruning will be required for some time, and the young tree should be encouraged to spread, though not to lie upon the ground; Plate CV. shows a good type of a young healthy citrus tree at this stage.

PLATE CVI.—YOUNG FRUIT-BEARING LEMON TREE.

The occasional thinning out of crossing branches or the suppression of a rampant water shoot emerging from old wood in such a position as to threaten the balance of the tree will be all that is necessary, should the young tree escape accidents, until such time as it begins to bear fruit crops freely.

The arrival of this period entails more care in pruning the lemon and citron than is the case with any of the varieties of the orange.

In Plate CVI. a young lemon tree with limbs bent with the effects of fruit-bearing is shown, and at this stage—although not shown plainly in the photograph—another character in the growth of the lemon is noticeable. As soon as the long slender shoots carry fruits on their extremities, they are bent into a pendulous form and often stiffen permanently into that position.

Plate CVII.—Pruning of Young Lemon Tree in Previous Illustration.

The erstwhile upper buds now being reduced to a lower plane, their progress is checked, and the dormant buds upon the bent limbs burst into active growth, producing erect shoots rising almost at right angles from the parent limbs.

These shoots should be thinned out and the extremities of older ones pruned away as they begin to recline upon the soil.

Plate CVII. shows this operation as applied to the tree figured in the previous plate.

The lemon will bear upon small twigs throughout the body of the tree as it increases in age, and to encourage this habit these laterals should be carefully thinned out to admit light—not sunshine—right into and through the tree, and thus encourage those left to carry fruit. The finest lemons are borne in this

PLATE CVIII.—TYPE OF LEMON TREE IN FULL BEARING.

manner, but oranges grown in this position are thick skinned, puffy, and inferior.

Plate CVIII. illustrates a good type of lemon tree when at a productive stage. This tree has been trained on the plan described previously.

Owing to the difference noted above respecting the positions in which the best fruits are borne upon the orange and lemon trees, there exists after they come to a fruit-bearing age a need for different pruning being applied to these trees. The foliage of the lemon must be regulated in such a manner as to make the passage of abundance of light through the tree an easily accomplished object. The best fruits of the orange being borne on the extremities of the twigs in the full light of the outer surface of the tree, strong light is not encouraged to penetrate into the centre, and the abundant sub-division of the main shoots is not eagerly sought.

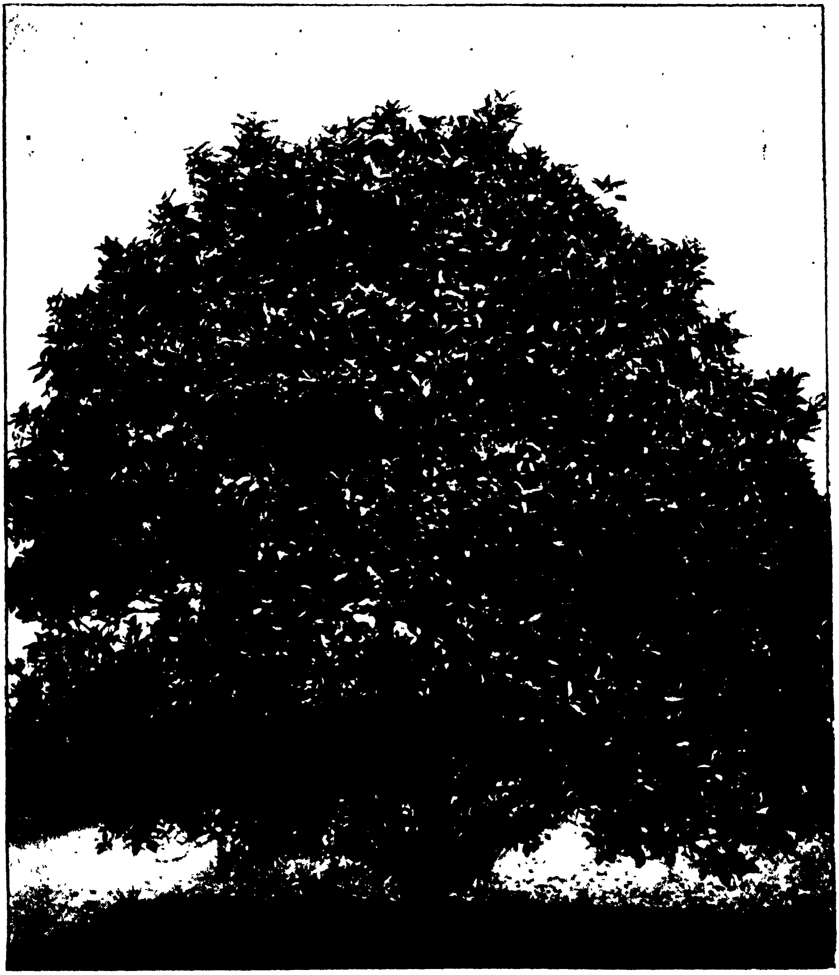

PLATE CIX.—WELL-FORMED ORANGE TREE ABOUT FORTY YEARS OLD.

Plate CIX. is a good type of an orange tree about forty years old. It is not over 20ft. high, but the diameter of the branches is greater, and it presents an immense fruiting surface.

This tree is like a huge high-domed umbrella when viewed from beneath the main stem and all the main and sub-main arms are bare of twigs, but the twig surface carries a complete canopy of leaves.

Any water shoots starting from these main shoots are regularly rubbed out whilst brittle and sappy and a free circulation of air permitted, thereby minimising the danger of certain insect pests and making the remedial treatment easier of application when necessary, as any spray directed from beneath reaches the under surfaces of the leaves.

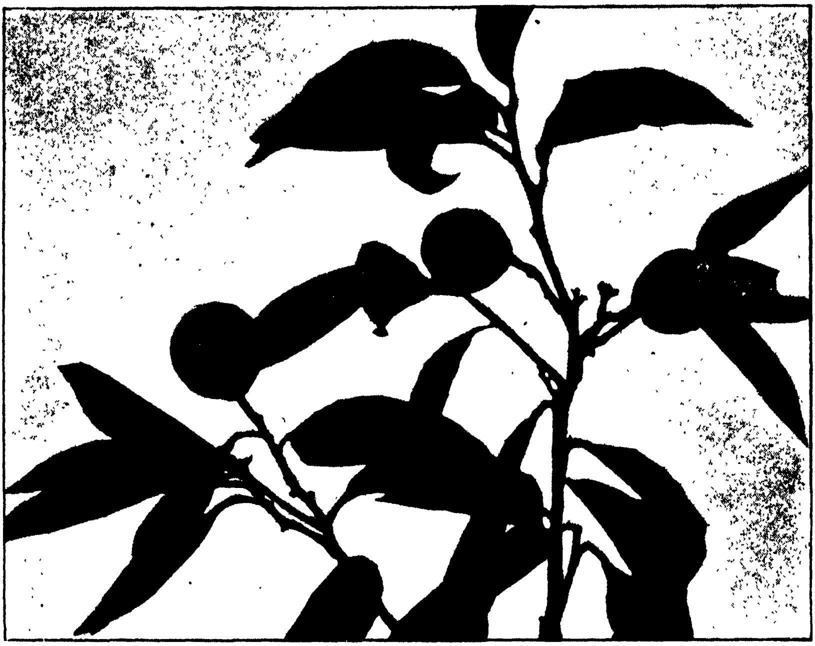

Plate CX.—Showing the Multi-branching Habit of Terminal Shoots on Citrus Trees.

In Plate CX. a very fair idea is conveyed of the multi-branching habit of the citrus family when the fruit-bearing stage has been developed. The common sweet orange is used in this illustration, but with slight modifications it is made applicable to all. If we examine the largest twig it will be seen that the central shoot was developed and produced a spike of flowers last spring, now represented by two oranges and several scars from which small fruits have fallen. It will be seen that from just near the base of each fruit stalk a young shoot has grown. In a natural state these formed a "brushy" cluster until flattened out for photographing. This time next season each of these three twigs would struggle to assume a similar condition to that held by the shoot now carrying the oranges and the above-named twigs themselves, and in this struggle the weakest or most unequally situated must go to the wall, though in the struggle the survivors also suffer.

The mitigation of this evil is the key to the pruning of citrus trees. The method is to thin out—not stump back, but completely remove—a fair proportion of the young shoots, allowing those selected to remain to receive sufficient light to retain their vitality.

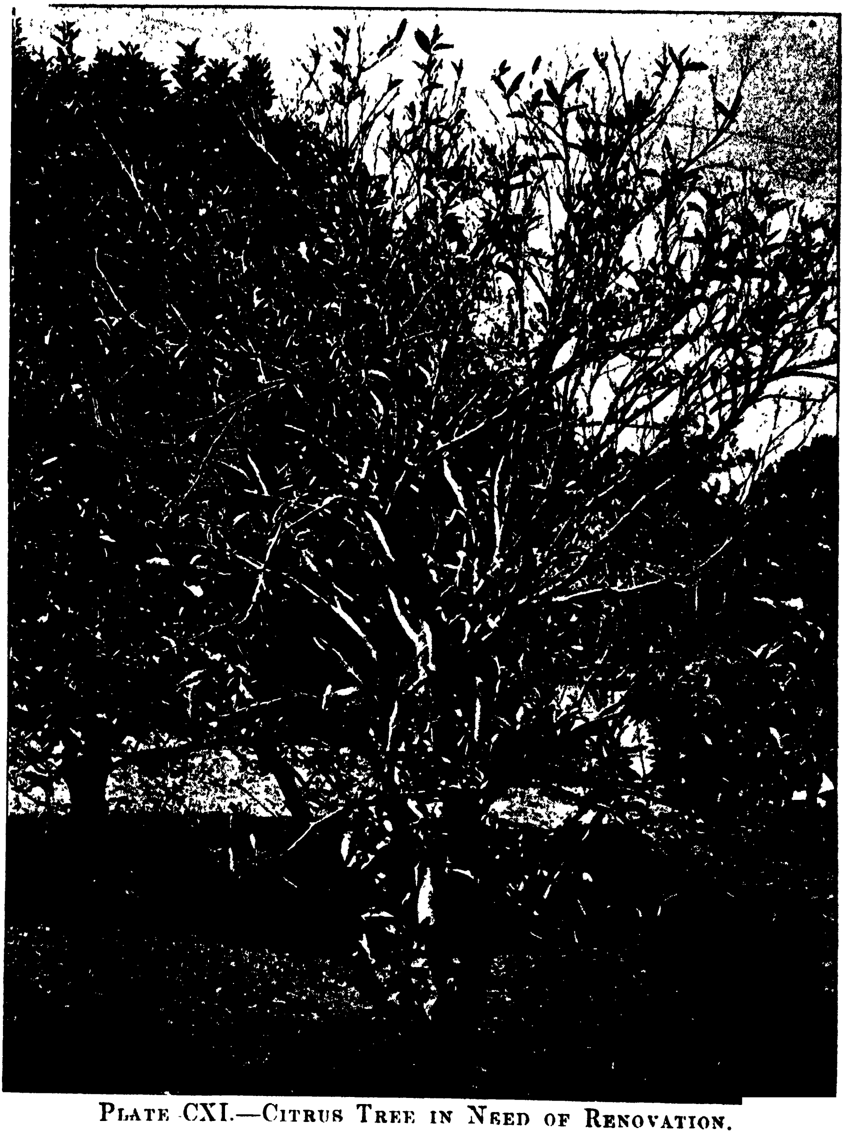

PLATE CXI.—CITRUS TREE IN NEED OF RENOVATION.

If no pruning is done in this direction the twigs gradually become weakened. The massed foliage protects insect pests which are partial to the weakly shoots. Gradually the twigs are reduced by stunting and insect attacks, and when a few die the decay spreads lower and lower until the tree assumes much of the appearance seen in Plate CXI.

Such a tree may be renovated if the main roots are sound and no "collar rot" exists. In Plate CXII. the tree shown in the preceding plate is pruned with a view to its regeneration. It has been cut back to healthy wood, where new shoots are breaking into growth. Pruning in such a case must be accompanied by liberal nourishment at the roots and a slight shelter overhead to ward of excessive sun heat until the branches are clothed with new foliage, if successful results are to be realised. At Plate CXIII. a shoot cut from a tree in the earlier stages of decay is depicted, and in Plate CXIV. the same

PLATE CXII.—SHOWING METHOD OF RENOVATION.

shoot pruned to healthy wood is presented. These small dead twigs, when permitted to remain, not only prevent the healing over of a decaying sore and thus gradually cause further decay, but being hard and sharp are largely accountable for inflicting much damage upon the growing fruits when the wind brings them in violent contact with the dead wood.

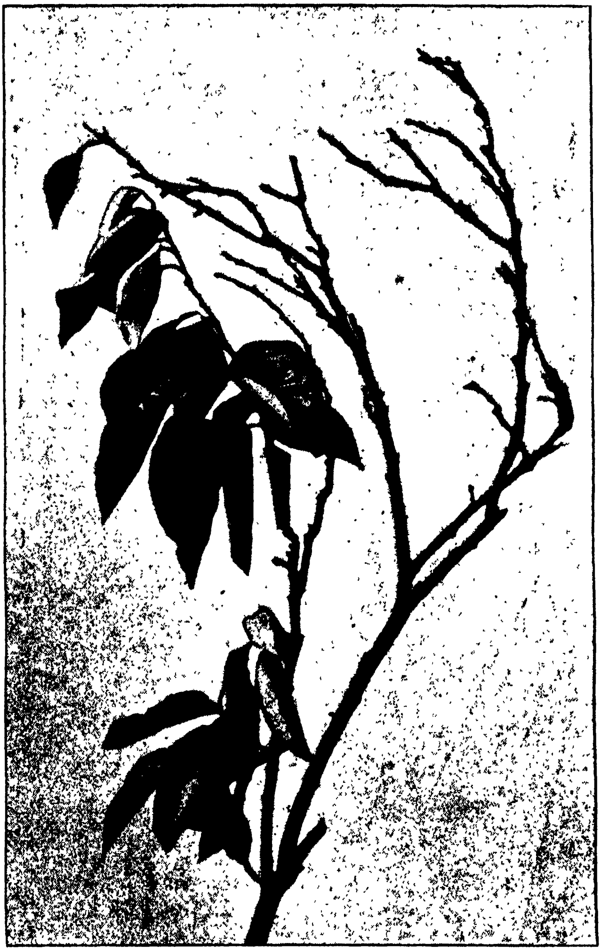

Plate CXIII.—Decaying Shoot of Citrus Tree.

The Loquat.

The early training of the loquat should be conducted upon lines similar to those advocated for citrus trees, and approximates closely to that applied to the sweet orange.

The fruits are borne upon the terminal growths. If Plate CXV. be closely examined it will be seen that a spike of flowers emerged terminally from the main shoot. The fruits set, ripened, decayed, and adhered. Immediately at

CXIV.—Treatment of Preceding Shoot.

CXV.—Loquat Branch Showing Whence the Young Shoots Arise.

the base of the fruit stalk three buds burst into growth, indicated by the twigs now triangularly supporting the old dried up fruit cluster. This is unusual, as a glance at Fig. 2 in Plate CXVI. will show, for there the stunting effects of non-pruning may readily be seen at the points. In the case of young trees the branches may be too numerous, as shown in Fig. 1 of the same plate. When this occurs thinning out could be beneficially applied as for reasons described respecting the orange.

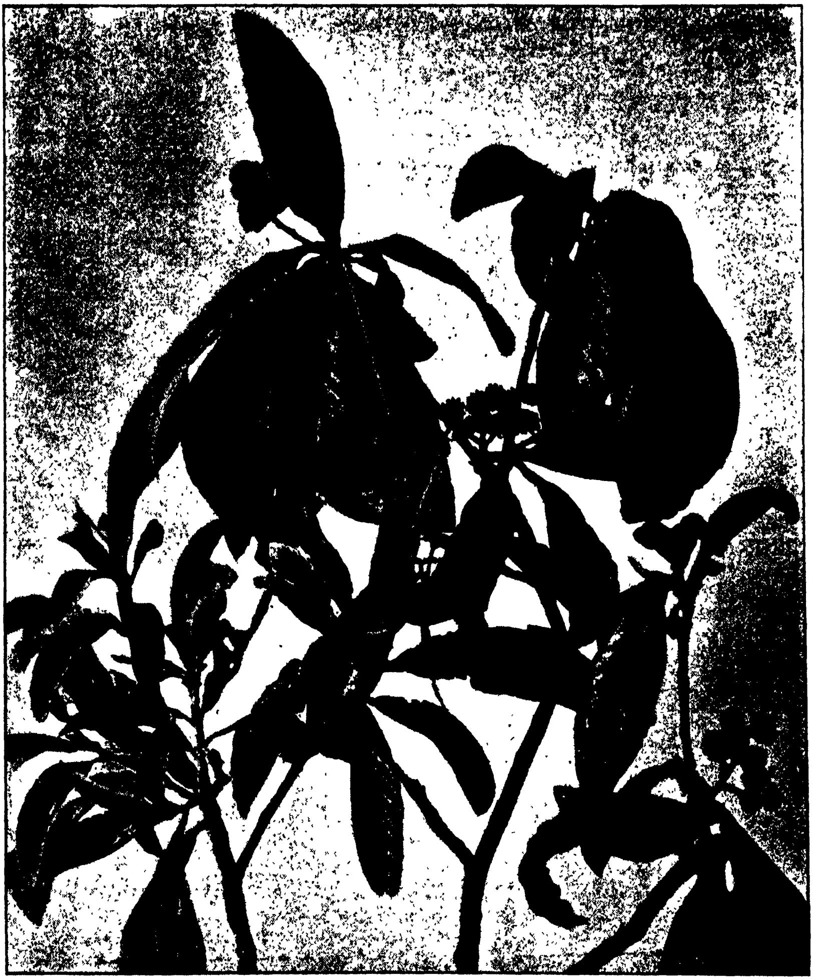
FIG. 1. FIG. 2.

PLATE CXVI.—LOQUAT SHOOTS UNPRUNED.

The following plate (CXVIII.) shows the dead twigs and fruit stalks removed on Fig. 2, and the superabundant shoots removed in Fig. 1. It will be noted that when the fruits are gathered the buds located at the base of the fruit stalk grow out into shoots during the summer, and near the apex of each an accumulation of buds with very short internodes takes place. In the following season (very early spring) the terminal bud unfolds and produces a stalk on which the flowers are borne. The closely located buds at its base then grow out almost to a common centre, forming the shoots referred to previously upon which in the coming season—should they be strong—flowers may arise. Plate CXVIII. shows type of a well grown loquat tree about 25ft. high. This tree is not only capable of producing a great quantity of fruits, but with its fellows form a most excellent wind break around the plantation. The pruning of the loquat may be summed up in consisting of removing dead, crossing, or crowded shoots,

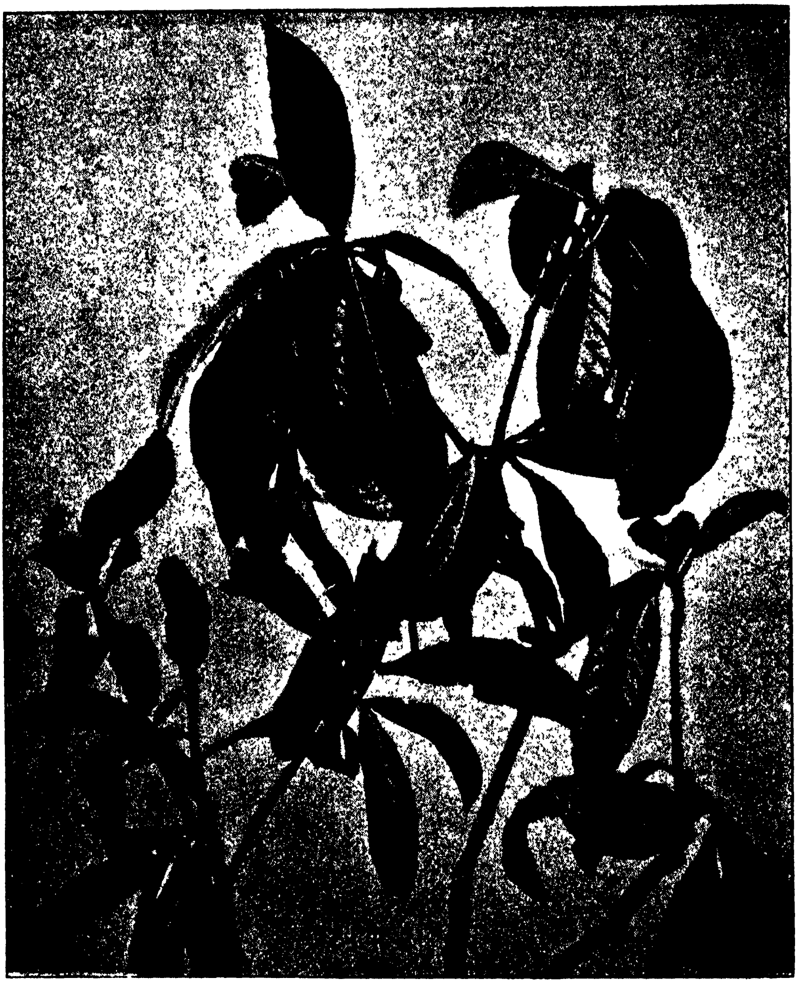

FIG. 1. FIG. 2.

PLATE CXVII.—SHOWING PRUNING APPLIED TO THE PRECEDING.

and cutting away old dead fruits and fruit stalks. The latter is of value in preventing the disease Fusicladium eriobotryæ, especially if the pruning be destroyed by fire immediately.

Plate CXVIII.—Type of Loquat Tree.

Hares Barking Trees.—Where hares or rabbits are troublesome in orchards the ground should if possible be wire-netted, but if this cannot be done the tree stems must be protected. Guards of reeds or straw are objectionableon account of the harbor afforded to insects. Various washes have been found beneficial, of which the following may be mentioned:—One pound commercial aloes in 4galls. water painted on the stems; equal quantities of sulphur, soot, and lime mixed to thick paint with cow manure; one teaspoonful of tincture of asafœtida mixed in about a gallon of liquid clay; dog's dung mixed with liquid clay or whitewash; slack one peck lime, and while hot add ½gall. crude carbolic acid, 1gall. soft soap, and 4lbs. sulphur.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, JANUARY 24, 1900.

Present—Messrs. F. E. H. W. Krichauff (Chairman), Samuel Good, W. C. Grasby, H. Kelly, W. Lowrie, T. B. Robson, Hon. A. W. Sandford, M.L.C., W. F. Snow, C. J. Valentine, and A. Molineux (Secretary).

Conferences and Shows.

The SECRETARY reported that the following Conferences and Shows in connection with the Branches had been arranged:—

Northern Conference, at Gladstone, on February 14.
Far Northern Conference, at Quorn, on February 16.
Northern Yorke's Peninsula, at Bute, on February 21.
River Murray Conference, at Mannum, on February 27 and 28.
South-Eastern Conference, at Lucindale, on March 15.

Watervale Branch would hold a show of products of the district on March 14; similar shows would be held at Cherry Gardens on March 15, and at Meadows on March 22.

Several members promised to attend some of these meetings.

Finances.

The SECRETARY stated that the Hon. the Treasurer had intimated that, if required for absolutely necessary work in connection with the Bureau, an excess would be granted on the current year's expenditure.

Bonus for Discovery of Phosphates.

The Hon. Minister of Agriculture intimated that Cabinet had decided to offer a bonus of £500 for the discovery of payable deposits of mineral phosphates.

Late Mr. J. L. Thompson.

It was decided to send a letter of condolence to the family of the late Mr. J. L. Thompson, Travelling Agricultural Instructor to the New South Wales Agricultural Department, and formerly Principal of the Hawkesbury and Dookie Agricultural Colleges. Feeling reference was made to the late gentleman, and to the great value of his work to Australian agriculture.

Frost and Wheat Crops.

Mr. KELLY called attention to the losses caused by frost this past season to the wheat crops. He noticed the New South Wales Department were making inquiries of farmers to ascertain manner and extent of damage, and suggested this Bureau should do the same. He had noticed on several occasions that the awns only of bearded wheats were injured, while the grain of the beardless varieties was shrivelled. Several farmers had told him they noticed the same thing, and he would like to hear from Professor Lowrie as to whether the bearded varieties were less liable to injury from frost.

Professor LOWRIE said he was strongly inclined to think so, and he knew many farmers, as the result of their experiences, were strongly of this opinion. It was a difficult matter, however, to settle, as the damage was purely climatic, and the extent depended almost entirely upon the condition of the crop when the frost occurs. About the time it comes into flower the plant is very susceptible to injury, and one variety may suffer severe injury from a frost which, if it had occurred a week earlier or later, would be practically harmless. This also applied to injury from hot winds. In France the injury from this cause was often severe, and it was the practice to sow varieties that would not come into flower when these hot winds were usually experienced. In 1892 he had some experience with frost. Beardless wheats like Tuscan and White Essex promised 27bush. to 28bush. per acre, but only yielded 7bush. to 8bush., but Baart wheat yielded fully up to expectations. The damage to the wheat resulted actually from extreme variations in the temperature when the plant was in flower. He had known one hot day in October to lessen the crop by two bags per acre, whitening and shrivelling the top, and also affecting the lower spikelets, many of which were only half filled.

Mr. **Goode** said it was a regular practice in parts of England subject to severe frosts to sow bearded wheats.

It was decided that members of Branches be asked to report on their observations of the effect of frost on the wheat.

Fermentation of White Wines.

Mr. **Snow** said he wished to draw attention to an important matter in connection with the fermentation of white wines. In the white wine districts of Bordeaux it was the practice to ferment the wine in comparatively small shallow vats; here in South Australia it was fermented in large bulk. Some four years ago he induced several vignerons to adopt the practice of using shallow vats, and one made several thousand gallons of wine in this way, with the result that it was greatly superior in every way to the wine fermented in bulk at the same vintage. This was an exceedingly important matter to our winemakers, especially as white wines were now receiving more attention.

Standard Sample of Wheat.

The Hon. Minister of Agriculture forwarded standard sample of South Australian wheat for 1899-1900, as received from Chamber of Commerce, and weighing 63lbs. per bushel. Members examined the sample carefully, and commented on the presence of bunt, shrivelled grain, &c.

Professor **Lowrie** said the sample was unworthy of the farmers of South Australia, and it seemed to him that it said little for the work of his department and of the Bureau that after these years of operations such a sample was sent to the corn exchanges in various parts of the world as the average of South Australia's wheat crop. Samples should be sent to the institutes throughout the colony, so that farmers could see for themselves upon what the price of South Australian wheat depended. Not one farmer in ten would allow such a sample to leave his farm, and he was confident that not one agent in a hundred had paid full market price for wheat of equal quality to the sample before them. It was damaging to the whole colony to have such wheat sent away officially as our "standard sample." He knew many farmers objected to a high standard, but he was convinced there was very little wheat this season that would not go higher than 63lbs. if cleaned properly. He believed all he had in the college barn would go 65lbs., and some that was tested as it came from the thresher without cleaning a second time went 67lbs. per bushel, but he could get no more for it than this inferior sample was worth. There must be something very wrong in the matter of getting the samples upon which the standard was fixed; there must be some difference in the minimum of the samples accepted by the agents taking samples for the standard, and what they would take as buyers. The farmers were cutting their own throats to oppose a higher standard, when such very poor wheat went 63lbs., and resulted in the price for South Australian wheat being based upon a sample which was a disgrace to the colony.

The SECRETARY suggested that it would be better to send samples to each Branch, and to the various conferences, and call special attention to the matter. Considerable discussion ensued, in which members commented unfavorably on the presence of bunt in the sample. It was decided to ask the Chamber of Commerce for samples to send to the various Branches and institutes.

Bunt.

In the discussion on the standard sample and the presence of bunt, a member inquired whether the professor could account for the prevalence of bunt throughout the colonies. It was frequently stated that the drill was largely the cause.

Professor LOWRIE said the proper pickling would absolutely prevent bunt. With the exception of a small piece sown with unpickled wheat, owing to running short of pickled grain just before finishing the day's work, he had no bunt in the college crops, and there were plenty others who used the drill who could say the same. If, however, the seed was not pickled properly, and contained bunt balls, the force-feed attachment of the seed-drill would break the balls and re-infect the grain, whereas with broadcast sowing this would not occur. He had no hesitation in saying that bunt caused more loss than hot winds and frosts put together, but unlike these latter, it was absolutely within the power of the farmer to control the disease.

Mr. GRASBY said the professor's explanation cleared up a matter of some importance. He had known instances where wheat had been pickled and part sown broadcast and part drilled in, the latter crop being badly infested while the former was quite clean. A good many farmers had noticed the same thing, and put the fault down to the drill.

Mr. KELLY said he never had bunt while he used pickled seed, and he had no doubt if the farmers would take out as many bunt balls as possible and pickle the wheat properly they would have clean crops. There was, however, a lot of inferior bluestone sold, and he believed this was partly the cause of the trouble.

The SECRETARY said a number of complaints of the adulteration of bluestone were made by their members, but he thought faulty pickling was at the bottom of the trouble. He suggested that the Bureau obtain samples from various Branches and have the same tested. If about twenty-five Branches in different wheat-growing districts were selected and samples forwarded, it would show conclusively whether there was any ground for the complaints. If adulterations were detected they could then take such further action as would be necessary.

The Secretary's suggestion was approved of, and he was instructed to communicate with the Branches to be selected.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

332. *Wheat following Barley, and the Killer of Wheat Haulms* (Ophiobolus herpotrichus).—Professor Dr. Frank has finally found the fully-developed perithecia of this fungus on barley, containing in small dark capsules, with neck-formed opening, many sporangia, in which he could see the characteristic eight vermicular long and thin colorless spores. It had been reported from many localities that wheat was a failure after barley. This seems now to be capable of being explained. Previously only a mycelium was found which befell the barley, but which might have been that of any other fungus, and it was not certain that any spores subsequently formed in the stubble remained dormant until wheat was sown. This question appears, however, now settled. Aphiobolus herpotrichus passes by means of its fine thread of mycelium through the lowest parts of the haulm and the roots of the wheat or barley plant. These parts of the plants die and become rotten. [If this fungus does not cause "take-all," it seems at least to act in a very similar way.—Ch. Agl. B.]

333. *New Butter Casks*, made by Karl Thiel & Soehne, at Lübeck, protect the butter completely against heat, and are being used for sending it long distances. The cask, made of beechwood, contains inside one of enamelled tin, and between the two, felt. These casks can, of course, be again and again used.

334. *The Carcass Show* of cattle, sheep, and poultry, at Islington, England, proved again that some of the animals which, when alive, had gained prizes were not so honored when in carcass. More especially among long-woolled sheep did the judges find fault with too much tallow in proportion to the lean meat. Only one prize was awarded where the tallow was 10lbs.; prize lambs had from 7lbs. to 9lbs. of tallow. The weights which secured prizes for each pair of poultry were as follows, viz.:—Dorkings, six months old, 16lbs.; Langshans, 21lbs.; Dorkings crossed with Indian Game, 29lbs.; Toulouse geese, 40lbs.; Embden crossed with Toulouse geese, 39lbs.; Aylesbury ducks, 17lbs.; American Bronzewing Mammoth turkeys, 52lbs.

335. *To Heal the Knees of Horses.*—The "Thierbörse" recommends to bring the fallen horse slowly into the stable, and to pour two buckets of water over the wound, without rubbing it, however. After this dry it with soft linen, and place on it well-combed cotton-wool of the thickness of a finger, over which you fix first a broad piece of flannel (no linen), and lastly a firmly-fixed knee leather. Leave this for three or four days untouched, when you remove the whole carefully without touching the scab which has been formed, and move the horse slowly about, so as not to break it. Put again cotton wool on, the flannel, and knee leather. In twelve or thirteen days the crust will fall off and a new skin with hair of the same color has been formed.

336 *Experiments to Preserve Timber.*—Published by Professor Gisevius, of Koenigsberg. Years ago experiments were made at Geisenheim with 6ft. long poles from pines, to be used for vines, and it was found that several fluids were better for preserving than merely burning the ends. Oil of tar, or carbolineum, were found useless, inasmuch as the creosote in them gave that taste to plants growing near, and other fluids were too expensive. But a solution of 2lbs. or 3lbs. of bluestone was found to be cheap, easy to use, and well preserving. Later experiments were made in the Agricultural School at Dahme, and at the hop garden at Süssenthal with pine and fir poles, 24ft. long, and with fencing posts. The solution impregnates, and rises within three or four days to the top if you remove the bark from freshly-cut stems and place the lower end into it. In trees cut some days before they are peeled and put into the solution, it rose only from 3ft. to 6ft. high. If it freezes this method cannot be used; the warmer it is the better. The casks must be very strong, and have to be filled up twice a day. For ninety hop poles, about 24ft. long, it required 6lbs. of bluestone.

337. *Preservation of Stable Dung.*—By experiments conducted by Professor Maercker, ground turf used instead of straw in binding the ammonia in the dung acted very satisfactorily in 1896 and 1897, and gave 12cwts. more of potatoes to the acre than where straw had been used. It being, however, impossible even in Germany to use it generally instead of straw, he sprinkled the dung made with straw with sulphuric acid of 1½ per cent., diluted with four times as much water, to prevent the escape of ammonia when loaded from a pit. An almost insufferable stench of sulphuret of hydrogen was the consequence of the decomposition of combinations of sulphur. The leaves of sugar beets manured with the dung without, and with the sulphuric acid increased from 99cwts. to 166cwts., and the beet increased by 20cwts. per acre. This great development of leaves showed an enormous surplus of nitrogen. Better results still had Professor Maercker with manure so treated on the dunghill against that which received no sulphuric acid. The increase of beets was 74cwts. per acre, where 320cwts. of dung per acre had been used. A like quantity of manure was used per acre for potatoes, and the increase in tubers was 38½cwts. Where only 160cwts. of dung had been used, 19½cwts. more tubers were harvested. The cost of sulphuric acid is not very great in Germany; for 160cwts. it would be 2s. 6d., so that its application would leave a good margin of profit. But as a smaller quantity of dung when treated with sulphuric acid may be quite sufficient for a medium crop, labor will be saved in spreading it, and the excessive growth of top somewhat checked, which a surplus of nitrogen will force. The after effects of the land manured as mentioned with the dung with the sulphuric acid were, however, very good. On some of the land which grew beet sugar in 1897, barley was grown as the next crop. Where the manure was from the open dunghill 700lbs. of grain and 1,411lbs. of straw was harvested; from the same area, where it was taken from a covered dunghill, 860lbs. of grain and 1,210lbs. of straw; from manure out of pits, 976lbs. of grain and 1,412lbs. of straw; and from such last-mentioned manure treated with sulphuric acid, 1,482lbs. of grain and 1,234lbs. of straw. This last result was so good, notwithstanding that the barley laid down early in the season, and showed thus the excess of nitrogen. Experiments with a marl containing 18 per cent. of carbonate of lime, of which a proportion equal to 5 per cent. of such carbonate of lime was added to the stable dung, and to another lot the same quantity with 2 per cent. of ground turf added, produced the following results per acre on potatoes, viz.:—without dung 145½cwts.; with, 320cwts.; dung, 186cwts.; with 320cwts. dung and 5 per cent. carbonate of lime, 205½cwts.; and where 2 per cent. of ground turf was added, 220½cwts. The last experiment

showed but slightly in favor of dung treated with sulphuric acid. Prof. Maercker remark that instead of carting the marl on to the land it is better to leave it on the dungheap to be carted out with the manure. Great cattle, producing daily about 75lbs. of dung, will require 4lbs. of carbonate of lime, or, if your marl contains 20 per cent. of it, 20lbs. of marl, or, if 50 per cent. only 12½lbs. In all cases it is necessary to trample down the dung, whether you use marl, carbonate of lime, or sulphuric acid.

338. *Mineral Manures on Small Farm.*—Director Dr. Claussen, of Heide, in Holstein, reports on a farm of sixty-eight acres, which consists of about three and a half acres of meadow land, about thirty-two acres of sand, and a like quantity of sandy loam, on which two horses and eleven cows are kept. Since 1884 the farmer used for the sand the following rotation:—On one-third he grows a yellow egg potato, manured per acre with thirteen loads of stable dung, 400lbs. of kainit, and 80lbs. of nitrate of soda; on one-third he sowed peas, manured per acre with 800lbs. of Thomas phosphate and 400lbs. of kainit; one-third was in clover and grass. The second year he grew rye, with 400lbs. of Thomas phosphate, and 400lbs. kainit, and 80lbs. nitrate of soda per acre; the third year oats, manured per acre with 400lbs. of Thomas phosphate and 200lbs. of kainit. The heavier sandy loam was used the first year for grazing until fallowed. The second year rye was sown, manured per acre with 400lbs. of Thomas phosphate, 200lbs. of kainit, and 80lbs. of nitrate of soda. The third year potatoes (magnum bonum) and turnips received per acre thirteen loads of stable dung, 400lbs. of kainit, and 80lbs. of nitrate of soda. The fourth year oats followed, with clover sown, manured with 400lbs. of Thomas phosphate and 40lbs. of nitrate of soda. The fifth year the land was in clover. In the stubble of the rye, plants for green manuring are always sown, to enrich the soil with nitrogen. In winter the stock receives besides the clover oaten and meadow hay and turnips, some flour of earthnuts, cotton seed, and feeding rice, to the value of £40, which increased the value of the manure. After deducting all costs, but no interest for the capital in the farm, the rye, peas, and oats gave him an average direct profit of £10 4s. per acre. The profit on the turnips was only 1¾d. per cwt. The cows gave 50,750 pints or 6,344 galls. of milk during the winter, feeding at a cost per pint of about 6 pfennigs (of which about eight are like 1d.). Dr. Claussen thinks that after this the farmer might reduce the quantity of mineral manures.

339. *Importation of Tanning Material into Germany.*—A very important alteration has taken place in tanning leather since the introduction of Quebracho (Aspidosperma quebracho) from Argentina, and Myrobalan (Terminalia chebula) from India. Bark from the oak, although having now become 40 per cent. cheaper than formerly, and producing a superior leather, is supplanted chiefly by quebracho. In 1885, only 36,382cwts. were imported; in 1895, already 436,924cwts., at a cost of £2,318,312. The quantity of wattle bark shipped to Hamburg was exceedingly small. Quebracho, I should think, might be grown here, and it would be quite worthy of a trial to obtain seed and information as to its soil, &c., through any English consul in Argentina. It is apparently shrubby, or sometimes tree-like, as we find our wattle. The bark is very rich in tannin, and even the leaves contain up to 27½ per cent., which produces, according to Sievort, an almost colorless leather.

340. *Ticks, Boophilus bovis, and Texas Fever.*—In the fifteenth annual report of the United States Bureau of Animal Industry there are several experiments described made at different stations. It appears to me that the evidence indicates unmistakably that the cattle tick is the agent for transmitting the disease; and so long as you can keep cattle in uninfected enclosures or lands, if you carefully examine them for ticks and oil the legs and soft skin of the body there is little danger of the fever. Cattle infected with ticks drop them when full grown, and these lay their eggs and thus infect the ground with young ticks that carry the germs of Texas fever to other cattle passing over the ground. The most satisfactory treatment seems to scrape the ticks off with a dull knife blade, grease with lard or oil, and feed well with green fodder. Mr. E. C. Schroeder, in charge of the experimental station for the Bureau of Animal Industry, has also demonstrated, by hypodermic injection of blood drawn from the jugular vein of a "southern" (that means an infected) cow during the cold weather, that the artificially produced disease of Texas fever was giving a fair immunity against it if afterwards mixing with "southern" cattle. He measured the degree and duration of the accompanying anaemia, which seems to show the most constant condition present in cattle suffering from Texas fever, by estimating frequently the number of red corpuscles per cubic millimeter of blood. These were found to be previous to the injection of 10c.c. of blood from nearly six millions to more than nine millions per cublic millimeter in the animals operated upon, and they became reduced sometimes from four to six weeks after the injection to under four millions, and once to under two millions. In this last case the heifer became very thin, but recovered eventually. Texas fever parasites were present in larger or smaller numbers in the blood, of which the corpuscles varied greatly in size, many being larger than normal. Five of the animals so treated were not affected when sent to the south amongst cattle affected with ticks and fever, four only in a very mild degree, while four other cattle not so treated forwarded at the same time (May 11th) died on June 20th, 26th, and two on July 9th. For the injection a small incision was made through the previously-shaved and disinfected skin

over the jugular vein on the neck of the "southern" cow. The vein was compressed below the cut, punctured with a hypodermic needle and a syringe connected with the needle by means of a short rubber tube. When filled its contents were immediately injected through a second hypodermic needle under the loose skin over the side of the neck of the animal to be treated.

M. Francis, Esq., D.V.M., the Veterinarian of the Texas Agricultural Experiment Station, has kindly forwarded to me bulletin No. 53 on the above subject, published in 1899. The experiments made there, in co-operation with the Missouri Experiment Station, in immunising cattle from the northern United States against Texas fever are described on 106 pages, from which I gather the following results. Cattle coming from the Northern States die always in large numbers—rarely less than 40 per cent., frequently 70 per cent. or more. The final results of experiments to determine whether sterile blood serum of immune "southern" cattle contained any chemical substance of the nature of an antitoxin, or toxin that could be utilised practically in stimulating at least a passive immunity in susceptible cattle, show that such material possesses *no* protective properties. Not the least mitigation in severity of attack generally resulted. Many died. The experiments on immunising cattle by infection with the microparasite of the disease, viz., by means of ticks, were a success; but, on account of the necessity of maintaining a quarantined pasture and of hand feeding in the case of calves of non-immune cows, this method is not as desirable as the blood inoculation by infection with the microparasite of the disease. Calves are more resistant to Texas fever than mature cattle. Continuous and severe infestation to which many calves were subjected by putting hundreds of fever ticks on them and running them on grossly infested pasture caused them to fall off greatly in flesh; the skins became harsh and scurfy (partly due to lack of nutrition), and while with some of them scarcely an elevation of temperature was observed, others had it up to 106·3 F. and an acute attack of fever for three or four days. When next year reinfested with ticks by hand and pasture neither of the animals showed any signs of sickness or fever. From twenty-one head of young cattle but one died from acute attack of fever within the usual period of thirteen to twenty days following tick infestation, and this one was infested with an excessively large number of ticks. Animals that had been well infected with ticks at the North proved immune when exposed to the more prolonged infestation in the South; but we may conclude from the experiments that complete immunity is not acquired by the young animal through a single mild infestation with fever ticks, but that the immunising process is a gradual one, requiring reinfestation and several months for its completion. The calves should be well nourished throughout the immunising period. As before stated, however, it appears from the experiments carried out that, in careful hands, and with proper management, preventive inoculation secures, not absolute immunity from Texas fever, but it is reasonably safe, and the more practical measure. Out of 432 animals inoculated, 8 per cent. died from fever. This large percentage of animals which recover from the artificial disease subsequently resists the infection when exposed to it in its most virulent form. Moreover, it is now probably certain that the disease known as "Red Water" in Australia is identical in its nature with "Texas fever," and if inoculations are made with the blood of animals which have recently recovered from the disease the degree of immunity is sufficient to enable the animal to withstand either disease. The inoculation may be accomplished by either of the following methods:—The northern plan is to confine the cattle in suitable quarters until the dangerous effects of the inoculation have passed before sending them south. The greatest attention to diet and comfort is necessary. A ration of equal parts of corn, oats, and bran, and also hay of timothy and clover, is given. But where grass is available fevered cattle appreciate it greatly, frequently refusing all other food. Success is in a great measure dependent upon proper nourishment. As a rule, from fifty to sixty days are sufficient for recovery, but some may not react sufficiently to the first inoculation and require a second dose. Inoculation in this case was made in Missouri in the early fall, and the cattle sent to an infected district in Texas, not before December 1st, because of the danger of great infestation with ticks before winter. The southern plan is to take the cattle south before the inoculation, put them into a small enclosed pasture into which no Taxas cattle have been allowed since July, and in which the grass is burnt about December 1st. Then, after erecting suitable shelter-sheds, and after some severe frosts, the cattle may be kept there from about January 1st. After ten or fifteen days they are inoculated, to give them time to recover from their journey and different food. Cactus is a very suitable food for cattle during the fever, containing a mucilaginous substance which has a laxative effect. A few acres planted with oats furnish also good pasture. But the cattle should be kept from ground infested with ticks until the fever has passed away. The initial dose of blood for inoculation should be small; from 1 to 2 cc. is within the limits of safety for calves eight to twelve months old. The fever appears about the tenth day. The destruction of the red blood corpuscles during this primary reaction is rapid. The animal's strength should be maintained by food, and the eliminative organs kept active. Salts may sometimes be necessary, in doses of 12ozs. The secondary fever period begins about the thirtieth day, and may last to the thirty-sixth and forty-third day. As cattle require fifty days to recover, they should not be exposed to ticks before that time.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Lucindale, Mr. George Humphris; Albert, Mr. J. Head; Meadows, Mr. D. D. Murphy; Cherry Gardens, Mr. H. F. Broadbent; Eudunda, Messrs. H. Martin and W. H. Marshall; Port Germein, Mr. E. J. Blesing; Gawler River, Mr. W. Clark; Hahndorf, Mr. Paul Schubert; Dawson, Mr. P. J. Byrne.

Reports by Branches.

The SECRETARY reported receipt since previous meeting of fifty-three reports of Branch meetings.

REPORTS BY BRANCHES.

Meningie, December 9.

Present—Messrs. M. Linn (Chairman), C. J. Shipway, S. F. Robinson, T. W. R. Hiscock. W. J. Botten, A. J. Myren, and H. B. Hacket (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report for year ending October 31 showed that twelve meetings had been held, with an average attendance of 7·6 members. Seven papers had been read and well discussed, the most important being on "The Binding of Sand Drifts" and "Co-operation." Other matters had been discussed, and, considering the long distances members had to travel, the meetings had been fairly well attended and the interest maintained.

EXPORT OF BUTTER.—A lengthy discussion took place on letter from Secretary Dairy Board in regard to the branding of butter for export.

Lucindale, December 23.

Present—Messrs. E. Feuerheerdt (Chairman), A. Dow, S. Tavender, W. Dow, A. Matheson, E. Hall, B. A. Feuerheerdt, L. McInnes, and E. E. Dutton (Hon. Sec.).

DEATH OF MEMBER.—The Chairman reported death of Mr. Lobban, a member of the Branch, and it was decided to send a letter of condolence to the widow.

CONFERENCE.—It was decided to hold the Annual Conference of South-Eastern Branches at Lucindale on March 25.

FALLOWING AND MANURING.—Mr. B. A. Feuerheerdt read the following paper on this subject:—

This subject is an important one from an agriculturist's point of view, one that has been and is discussed and practised almost everywhere, not only in South Australia, but in other wheat-growing countries, yet very little mention is made of it in this district. The early settlers of this district tell us that the farm land of these parts was at one time very fertile, and gave excellent wheat crops—20bush. to 30bush. per acre. How much of that same land is there now that will give the same returns? Apart from virgin or heavily-manured plots, I might safely say none. Even the most fertile soils will not stand continuous cropping for an indefinite period without fallowing or the application of manure. There may be thousands of pounds per acre of the necessary ingredients to form plant food, yet they may not be available for immediate use. No matter how rich the soil may be in plant food, if it happens to be in an insoluble form, it is not available for the plants sown thereon, the reason being that plants can only obtain their nourishment from the soil in the form of a solution. This insoluble plant food is converted into the soluble or available form so slowly that a few crops in succession will often produce a temporary exhaustion, the demand becoming greater than the output, with the result that our land becomes "wheat-sick." Could this "wheat-sick" land be permitted to remain idle for a sufficiently long period, it would (owing to atmospheric agencies, moisture, and sunlight) eventually become in good heart again. But this would take so long that I doubt whether many of the older farmers would live to see it. Therefore we must look for a more practical remedy, namely, fallowing and the systematic application of manure.

Now, the three chief factors which convert the unavailable plant food into a soluble or available form are—(1) Moisture, (2) atmospheric agencies, (3) sunlight. Therefore a perfect fallow would be—(I.) one in which the maximum amount of moisture is retained in the soil during the summer; (II.) one in which the soil has been worked in such a manner that the air has had free access to as great a depth as possible; (III.) one that has been kept free of weeds. The manner in which I should recommend the farmers of this district to conduct their fallowing would be as follows:—As soon after harvest as the soil will permit run the scarifier through your stubble lands. This gives the air free access to the soil through a good part of the summer. Then when the first rains come the weeds will start earlier and more regularly than if the soil were unworked. This will provide nice early feed for young sheep, which should be allowed to graze on it until after the general seeding operations. Directly seeding is finished put the plough into it, and plough as deeply as your soil will permit. Do not harrow after this ploughing, but leave the soil rough and open during the whole winter. About the beginning of October or late in September this is ploughed again, lightly, just deep enough to bury weeds without turning up much of the moist soil from below. If we bring the moist soil from below to the surface just as the hot weather is commencing there is bound to be a loss of moisture through evaporation, and that must always be avoided. After this second ploughing the soil may be worked down to a good tilth with the harrows, and left as bare fallow, or a fallow crop sown. Maize, I think, is the most suitable for this district. If you intend sowing a fallow crop give a dressing of bonedust, say 2cwts. per acre. It will help the maize crop considerably, and if fed down with sheep very little indeed of the manurial properties of the bonedust will be lost to the succeeding wheat crop. Bonedust decomposes very slowly in the soil, so that it would be advisable to sow it in spring, whether a crop of maize be grown or not. Having had six or seven months' time to decompose, a good deal of it would be ready for immediate use when the young plant is germinating, and consequently the wheat crop will get a good start. Whether a fallow crop be grown or not, the field should be kept loose on the surface and free from weeds.

The seeding operations for the following wheat crop will be comparatively simple. After the first general rains, when the weeds have started, scarify once and sow your wheat in the usual way, and harrow, or, if a drill be used, let it follow the scarifiers.

For this district I most decidedly favor early sowing—as early as possible. The young plant gets the benefit of the warm genial weather of autumn, and makes a fairly good start before our cold and severe winter sets in, and seems better able to withstand the rough weather.

Mr. Hall thought the paper an excellent one, and would apply where the soil was deep, with clay underneath; but in this district, where the soil was so shallow and resting on rock, fallowing would do more harm than good.

FRUIT PESTS.—Mr. Hall found boiled linseed oil painted on the affected parts destroyed woolly aphis on apple trees. Mr. Tavender said coal tar would have same effect.

EXHIBITS.—Mr. McInnes tabled fine samples of peaches, plums, and apples.

Pine Forest, December 12.

Present.—Messrs. W. H. Jettner (Chairman), E. Masters, F. Masters, G. Inkster, and R. Barr, jun. (Hon. Sec.).

FORESTRY.—Two members undertook to raise forest trees for free distribution amongst their fellow members.

WHEAT HARVEST.—After careful computation of results, members were of opinion that the average yield of wheat within an eight-mile radius of Bews would not be more than 3bush. per acre this season—a very disappointing result, especially when the extra cost of cultivation through the use of fertilisers is considered. Many paddocks drilled in with superphosphate gave only 2bush. per acre, due to the dry season. On fallowed land, however, no single instance of failure where manure was used could be found; in fact, members doubted whether any paddock that was fallowed and manured within the district had given less than 8bush. A discussion ensued on the value to next season's crop of the fertilising ingredients put into the land, but not used by the present crop, owing to the dry season. The opinion expressed by Professor Lowrie at the Alford Conference—that the soluble phosphates would revert in the soil and become of no more value than the phosphates in Thomas phosphate—was quoted.

CHANGE OF SEED.—Exchange of seed wheat took place between several members, and a discussion ensued on the advantages of change of seed from a dry to a wet district and *vice versâ*. It was generally agreed that seed from a wet district could not be expected to do well in a dry district the first season, but when acclimatised good results would be obtained.

Bakara, December 14.

Present—Messrs. H. R. Hayward (Chairman), R. Hayward, W. G. Wilson, T. Hermann, J. E. Dietrich, R. Barrow, J. Barrow (Hon. Sec.), and three visitors.

HORSE-BREEDING.—Considerable discussion took place on this subject. The Chairman advocated a stallion tax of £15 per annum to do away with the many so-called draught stallions kept by farmers, and travelled when sufficient inducement offered. If these inferior animals were got rid of they would soon secure the services of a pure-bred Clydesdale to travel the district. Members disagreed, as they were of opinion that it would lead to an increase in the fee for service, and would not improve the breed of stock. They thought that no stallion should be allowed to travel unless licensed, and that no license should be issued before the animal is certified by a competent veterinary to be sound. Mr. Dietrich reported some of his foals were born blind, a skin appearing over the eye. Though eight to eleven weeks old they still remain blind. He had tried tobacco juice, also sugar, without doing any good. [A surgical operation by a competent veterinary is required.—GEN. SEC.].

Cradock, December 16.

Present—Messrs. R. Ruddock (Chairman), J. Paterson, B. Garnet, T. Marsh, P. Gillick, P. O'Dea, W. Symons, J. H. Iredell, and two visitors.

STOCK COMPLAINT.—The Hon. Secretary reported a serious complaint amongst horned stock, many deaths having resulted from acute inflammation of the bowels. Stock Inspector Dowdy has visited the district, and in his report to the Branch expressed the opinion that a vegetable poison was the cause of the trouble

SHEEP.—Mr. Marsh read a paper on "Keeping Sheep on a Small Farm," as follows:—

My farm contains 1,100 acres. About seven years ago I started with fifteen sheep, and during good and favorable seasons my flock increased to about 170 sheep. I usually got two lambings during the year, and sometimes got 100 per cent. each lambing. During the very bad seasons they were reduced again, through losses, mostly by dogs. I fenced off about 500 acres, and divided this into four paddocks containing about 125 acres each; these I made cultivation paddocks, making them sheep-proof and keeping the bottom wire low to prevent the young sheep creeping, because if they get the habit they become troublesome. I also find the sheep-proof fence with barb wire on top very useful in preventing cattle feeding through and straining the wires, which tends to destroy farmers' fences in a very short time. The paddocks, which were very bad with wild oats and other useless growth detrimental to wheat-growing, have been made quite clean through the use of the sheep. At present I have only sixty-three grown sheep and twenty-eight lambs. The return from the wool was very satisfactory—£26 8s. clear of expenses; besides this I kill upon an average about thirty each year for meat. All things considered, I think sheep can be kept upon a small farm profitably. To take moderate seasons: I could keep 150 sheep on 500 acres by allowing them a plentiful supply of water and run in the stubble paddocks after the horses and cattle have had their turn off them, for sheep will do well fed from straw with plenty of water, and to be successful the sheep must be bred on the place. They will do where strange sheep would starve. In addition to returns for wool I also received a very satisfactory return from sheepskins.

Mr. Gillick said 500 acres of their ordinary land were not sufficient for grazing 150 sheep. He agreed that sheep bred on the farm did better than strangers. Mr. Symons thought the practice of putting the sheep on the stubble had a deal to do with Mr. Marsh's success.

Mundoora, December 15.

Present—Messrs. R. Harris (Chairman), T. Watt, J. Blake, W. Shearer, J. J. Vanstone, G. Haines, A. McDonald, W. Mitchell, D. Smith, and A. E. Gardiner (Hon. Sec.).

FORESTRY.—One or two members undertook to raise sugar gums for gratuitous distribution.

TO PREVENT BELT FROM SLIPPING.—In reply to inquiry from Orroroo Branch on this point, Mr. Vanstone found that a piece of leather round the pulley was safe and effective. The Chairman uses a little resin and Mr. Blake oil for this purpose.

SCARIFYING FALLOWS BEFORE SOWING.—Mr. McDonald stated that one of his neighbors scarified a portion of his fallow before sowing, then sowed and harrowed in the seed. The result was very unsatisfactory, the crop on the portion so treated blowing down badly.

STOCK COMPLAINT—The Chairman called attention to a statement of a member of Mallala Branch that he found it beneficial to shift his cattle frequently from one paddock to another. Members thought the plan worth trying. Reference was made to disease causing deaths of cattle during past few years. Mr. Blake wished to know whether the complaint was due to defective breeding or defective feeding. He did not think it the former, as two of his best-bred cows had died.

BUNT.—The Hon. Secretary reported that he found a little bunt in his wheat, the seed being obtained from headed wheat. It was quite clean and pickled, and sown in two different paddocks alongside a crop the seed of which was bunted and pickled, but stripped instead of being headed. Members consider it worthy of notice, and would like to know whether cutting the wheat for heading when too green would have an injurious effect. Mr. Shearer mentioned an instance where a few lands sown in wet weather were badly affected by bunt, while alongside the crop put in in dry weather was quite clean. Members are convinced that sowing in wet weather without pickling was one of the chief causes of bunt.

Port Germein, December 16.

Present—Messrs. J. K. Deer (in chair), E. McHugh, D. Thomson, C. O'Loughlin, J. R. Gluyas, A. Thomson, W. Crittenden, W. Mortess, G. Stone, and A. H. Thomas (Hon. Sec).

CONFERENCES.—Considerable discussion took place on question of being represented at Conferences of Branches to be held at Gladstone and Quorn on February 14 and 16 respectively.

Swan Reach, December 16.

Present—Messrs. P. A. Hasse (in the chair), F. F. Brecht, F. Fischer, L. Fidge, J. L. Baker, E. Micke, P. A. Beck, O. Halliger (Hon. Sec.), C. Drogemuller (Bowhill Branch), and three visitors.

CHAIRMAN.—Mr. J. L. Baker was elected Chairman, *vice* Mr. J. O. J. Kohnke, resigned.

CENTRAL BUREAU.—A motion was carried unanimously expressing regret that the funds placed at the disposal of the Central Bureau for the working of the Bureau had been reduced, and the hope expressed that the Government would at least provide as much money as in previous years.

SIZE OF WHEAT BAGS.—Mr. Baker complained of the variations in size of wheat bags. Some held only 200lbs. instead of nearly 300lbs., and when the bags had to be bought at a high price and sold as wheat this was a great injustice to the farmers. He also considered the present method of selling bags is detrimental to the interests of the producer. Members generally agreed, and some discussion took place on the action of the Farmers' Union, the local agent explaining what had been done, and pointing out that the more the farmers supported the union the better the results. It was agreed that the union had done good service for the district and for farmers generally.

FLORICULTURE.—Mr. P. A. Beck read a short paper on this subject to the following effect:—

"Floriculture" means the cultivation and care of flowers, and it has been remarked by good authorities that it is one of the purest and healthiest of pleasures. I am sorry to see that so little in this line is done in our district, and I noticed with regret the poor collection of flowers at our agricultural show at Swan Reach in September last. I am certain that a small plot enclosed with wire netting and planted with hardy annuals and perennials would give much pleasure, not only to the grown-up, but also to the children, who in most instances would do most of the easy work. It is very pleasant to be able to put a bunch of flowers on the table or about the rooms. Now I consider that all these pleasures may be had with a minimum of labor being expended, and particularly those living on the banks of the Murray would be in a position to irrigate, but I have seen nice flowers grown by a few of our members nine or ten miles from the river banks without irrigation, entirely depending on the natural rainfall. There was a small flower garden in front of our post office, which was admired by scores of people. I would therefore strongly recommend members to try a small flower garden, say, 60ft. by 40ft., or even smaller, and try such flowers as stocks, geraniums, hollyhocks, a few varieties of roses, and some hardy annuals; and feel confident that they will get well repaid for their trouble.

Paskeville, December 16.

Present—Messrs. A. C. Wehr (Chairman), H. Koch, J. C. Price, J. Bussenschutt, A. Bussenschutt, G. Bammann, T. Trebilcock, J. H. Nankervis, and W. S. O'Grady (Hon. Sec.).

FIELD TRIALS.—The question of holding field trials yearly or each alternate year was discussed. This Branch favors a field trial being held each year, but would have one year trials of harvesting machinery and the next of implements of cultivation, so that each class of exhibitors were only called upon every alternate year.

STANDARD WEIGHT OF WHEAT.—Mr. Price called attention to the fact that the corn trade section of the Chamber of Commerce had sent for samples of wheat of present season's growth bought at full market price, in order that the committee might fix the standard for the season. It was resolved—"That this Branch strongly objects to this manner of arriving at the average sample of the season's wheat, and would solicit the co-operation of other Branches in protesting against it, as the members consider that average samples of all wheat sold should be taken."

Albert, January 8.

Present—Messrs. G. Holmes (Chairman), F. Drogemuller, C. Setterberg, R. Norton, W. Freer, H. L. Smith (Hon. Sec.), and three visitors.

MEETINGS.—Decided to hold monthly meetings at Moorook from December till June and at Kingston from June until December.

BITTER CUCUMBERS.—Mr. Drogemuller said that bitterness in cucumbers is due to insufficient supply of water. Thoroughly drench the soil every time the plants want water.

FARMERS' UNION.—Mr. Drogemuller strongly advocated the advantages to be derived from the Farmers' Co-operative Union.

Stansbury, January 6.

Present—Messrs. Alex. Anderson (Chairman), C. Faulkner, J. Sherriff, P. Cornish, and P. Anderson.

FOREST TREES.—Mr. C. Faulkner agreed to raise a number of sugar gum trees for free distribution to members.

BAGS IN —Mr. P. Cornish pointed out objections to the practice of wheat-buyers in paying for bags as weighed in with wheat. The bags cost the farmer 7d. each, and he gets only 1½d each for them when weighed with the wheat. In some places if the bag has a patch on it the farmer is docked 4d., making it cost him 11d., and he still gets only 1½d. for his bag. Members consider this practice most unfair, and think the merchant ought to return the bags.

MALLEE STUMPS.—Mr. J. Sherriff thought a hook could be made for pulling out stumps with a strong team. If sold the price received would pay for the grubbing. Mr. P. Anderson thought it best to leave the stumps in the ground, and keep the draught of the plough as light as possible.

GRUBS.—The Chairman said there were no grubs this year where they were so plentiful last season, and there was a very nice crop of wheat instead. He noticed many thousands of ladybirds in those paddocks.

Lipson, December 6.

Present—Messrs. G. Provis (in chair), Jas. Brown, Chas. Provis, W. F. J. Darling, E. J. Barraud (Hon. Sec.), and two visitors.

SEED WHEAT.—The Hon. Secretary advised farmers to be very careful in cleaning seed wheat, as pieces of whitehead, &c., are apt to choke the feed and cause irregular seeding.

POULTRY DISEASE.—Mr. Darling said his fowls were losing the use of their legs, and wanted to know cause and remedy. [Perhaps it is caused by fowl ticks (Argas reflexus). Look at bare spots between thighs and body and at base of wings. If ticks are found sticking in the skin dab them with a piece of flannel or sponge damped with kerosene, remove the fowls to a new place, and burn the old fowlhouse.—GEN. SEC.].

MACHINE BELTING.—Mr. C. Provis wanted to know what is best to use on belting to prevent it slipping. He was advised to cover the pulleys with leather and use neatsfoot oil on the belt. [Have you tried grasstree or "yucca" resin?—GEN. SEC.]

PIG FEED.—Mr. Brown wished to learn which is the more economical food for feeding pigs—copra cake or wheat. The Chairman said at present prices wheat is most probably the cheaper feed.

Mount Bryan East, December 16.

Present—Messrs. T. Wilks (Chairman), E. Prior, A. Pohlner, W. Dare (Hon. Sec.), and three visitors.

GARDEN PEST.—Mr. Phillips (visitor) tabled "grubs" which were destroying his tomatoes, cabbages, &c. He had found as many as half a dozen from a piece of soil a foot square. Members wished to know how to destroy the "grubs." [As specimens have not been forwarded it is impossible for me to say what the "grub" is or how to eradicate it.—GEN. SEC.].

STANDARD BUSHEL AND BAGS AS WHEAT.—It was resolved not to comply with request of the Chamber of Commerce for sample of present season's wheat sold at full market price. Some discussion ensued on the question of high price of wheat bags and the custom of selling bags as wheat. It was stated that buyers dock 2d. if the bags have a small hole or mend in them. Members favored the old custom of buyers supplying the bags and charging for those not returned, or allowing for the bags when supplied by the seller.

Gladstone, January 6.

Present—Messrs. C. Gallasch (Chairman), J. Shephard, J. Rundle, J. Brayley, E. Coe, W. A. Wornum, J. King, C. R. Phillis, and J. Milne (Hon. Sec.).

CONFERENCE.—Arrangements in connection with the Annual Conference of Northern Branches, to be held at Gladstone on February 14, were dealt with. The Hon. Secretary reported thst several members of Central Bureau had promised to attend. Messrs. C. R. Phillis and E. Coe promised to prepare papers for the Conference.

NEW WHEATS.—Mr. King reported favorably of a new wheat called Viking, which he was raising. From 117lbs. sown last season he reaped 70¾bush.

SEASON.—The Hon. Secretary reported rainfall recorded for 1899 14·47in. Members estimated the yield for district about six miles by eight miles, including hundred Yangya and parts of hundreds Booyoolie and Bundaleer, to average about 10bush. wheat and 1 ton hay per acre.

Mallala, January 7.

Present—Messrs. H. B. Moody (Chairman), S. Churches, S. Temby, A. F. Wilson, F. M. Worden, M. H. East, J. Jenkins, A. Moody, W. R. Stephenson (Hon. Sec.), and three visitors.

HARVEST.—Considerable discussion took place on the results of the late harvest, and it was agreed that 6bush. or 7bush. per acre would be a fair estimate of the grain reaped in this district. Many sections yielded 10bush. to 12bush., and some still more, but the late-ploughed land was in every case a comparative failure.

BINDER AND HEADER.—Mr. H. B. Moody read the following paper on this subject:—

Being the inventor of a most complete machine in the form of a header, and having used one of them myself during the past three harvests, dealing with about 4,000 bags of grain, members will admit that I should be able to speak with some authority on the subject of harvesting with the binder and header. It will not be necessary to say much about the advantage to the farmer in having his straw in sheaves, and stacked on the most convenient part of his farm; it will be apparent to all that had this method of harvesting been general during the last few years the many thousands of cattle which perished through the recent drought might have been saved, and had no drought occurred the farmer with the use of his straw could have increased the number of his stock possibly by one-third. What I am most anxious to make known is that more grain of a better quality can be obtained by this method of harvesting than can be got by the use of the stripper. Grain that is cut with the binder in a semi-ripe stage and left to ripen in shocks will weigh heavier, have a brighter color, and contain more gluten than if left to ripen on the field. As the stripper cannot be started until the crop is quite ripe a loss is incurred which many farmers know nothing about. The fact that Manitoba flour is worth £2 per ton more than South Australian is, I think, due to the deterioration that takes place in allowing the crop to stand in the field until it has passed the stage when it could be more profitably harvested, and if the binder and header were more generally used our flour would not be found inferior to the production of any part of the world. This loss is insufficiently known, but when the farmer knows that, while providing himself with a plentiful supply of fodder, he would have more grain to dispose of, and of a quality that would command a better price, he should not be slow to adopt it. It is not always possible to head the crop, but there is no case of failure in the growth of the crop where the binder and thresher would not give a better result than the stripper; and while my machine provides for thrashing, I would not recommend it where the crop could possibly be headed, even if a quantity of the grain had to be left in the straw. Thrashed straw must always be inferior to sheaved straw, from which practically only the grain and chaff have been taken, not merely because it is loose, but the saccharine which is contained in the pith to some extent is blown out in the operation of thrashing, while the skin and fibre, which is the natural protection of the nutriment, being broken, the dust and air are admitted, and, unless pressed into hard blocks, must cause deterioration. I estimate a crop of wheat to yield about two bags of grain per ton of sheaves, and that a farmer having 300 acres of crop, averaging 1 ton to the acre, would get 600 bags of wheat, about twenty bags screenings, and about 230 tons of straw and chaff. Taking the same crop for treatment with the stripper, the farmer to provide hay must cut fifty acres, representing 100 bags of wheat, or 50 tons of green hay; and, supposing that no loss occurred by shaking or otherwise, and allowing that his wheat would weigh as well, and be equal in quality, he would have 100 bags less wheat to dispose of, and reckoning his chaff at 6 tons, he has 50 tons of green hay, and 6 tons "cocky" chaff, against 230 tons useful fodder. In contrasting the cost of binding and heading with stripping and winnowing, not taking wear and tear or interest on machinery into account, as this would be about equal in either case, I estimate that the binding and shocking of a ton to the acre crop, including twine, costs about 2s. 3d. per ton, or 1s. 1½d. per bag of wheat, and that stripping and winnowing can be done for 1s. 3d. per bag, carting, heading, and stacking (allowing 4s. 6d. per day for men and boys, and 1s. 6d. for each horse working the machine with horse works, and finishing sixty bags per day) costs about 1s. 3½d., or a total cost of 2s. 5d. per bag. It will thus be seen that there is a difference of 1s. 2d. in favor of the stripper, and against this it must be taken into account that under any circumstances there would be 1bush. to the acre wasted by the stripper, while the binder would leave practically nothing, and if this be taken at 3s. per bushel it shows that, without making any allowance for shrinkage in the grain or loss by shaking, the farmer can have his straw in sheaves, and get additional wheat more than sufficient to pay for the extra labor. Treating with the cost of machinery, I put down two binders at £55 each, complete header, £75; horseworks, at £35; and as the wagons would only be used for the purpose during the harvest, I put them down at about half cost, £60; total £280. I consider it requires three strippers to perform the work that can be done with two binders, and these cost £58 each; one winnower, £30; wagon, £45; binders to cut the hay with, £55; making a total of £304, which merely provides the machinery where the stripper is used; and if the crop failed for grain another binder would be required to cut it for hay, while the horseworks or engine would also be required for chaff-cutting. It will require too much time for me to give a minute description of the working of the machine; sufficient to say that eight men can work it by first loading the wagons, and all coming in to perform the heading and stacking; but if the machine is to be kept going, not less than three wagons are required to bring the sheaves to the machine, and if an engine can be had to work it, four wagons would be kept busy, and eighty bags might be finished in a day. It requires three hands to stack the empty sheaves, and as these fall from the elevator at the rate of thirty-five per minute, the stacker requires to have some previous knowledge of his work; two more hands are wanted to send the sheaves down from the load to the feeder, one to throw back the chaff and perform other jobs, another to attend to and sow up the bags, a boy to drive the horses, and four in the field loading the empty wagons, thirteen in all; and with an equal number of horses, a team is provided capable of finishing 30 tons of sheaves per day. The success in heading greatly depends upon how the binding has been performed. Do not allow the binder to make a flat or wide sheaf. What is wanted is a moderate sized sheaf very tightly bound with the band as far from the heads as the length of the straw will allow, irrespective of the height of the crop; better have a few fans than the string in the header. Such sheaves are rather difficult to stand in the shocks, as owing to the tightness of the string the heads fall back, but from experience I would recommend laying them down, reversing the heads in the first three rows, then laying all the heads one way until a pitch is got that will turn off the rain, always keeping the low side of the stack to the west, or wherever you expect a storm to blow. A crop of wheat can generally be cut from eight to twelve days earlier than it can be stripped, but if for want of sufficient binders, or weather not permitting of this work being done at the proper time, nearly as much can be cut with the binder after the crop has ripened without loss of grain as can be done with the stripper, by making an early start in the morning and working again in the evening, and keeping going throughout the day when weather would not permit of stripping being done; but for every reason the binding should be done before the stripping could be commenced, and as most weeds which give the farmers so much trouble will be swept off the field by the binder they should be removed before they begin to shake. To facilitate the binding the roads around and between the different varieties of crop, or at intervals that appear to separate it according with the different stages of ripeness, should be cut early, and these will provide a little green hay. As this is all the hay the farmer need necessarily make, the time that would otherwise be thus occupied might be devoted to the working of his fallow. In conclusion, I think that in this colony where practically grain and fodder have to be provided from the same crop, and where drought occurs so frequently, that with the example of the Agricultural College, and the information imparted through the Agricultural Bureau, it is only a matter of time and we will see the thousands of tons of straw that are either burnt or trodden under the feet of the cattle will be gathered, and in most farms throughout the colony both cattle and sheep very largely increased in numbers.

A general discussion followed, and it was agreed that as a means of providing food for stock there was much in favor of the header; but there was a difference of opinion in relation to the waste of the two methods.

Meadows, January 8.

Present—Messrs. J. Catt (Chairman), W. J. Stone, W. Pearson, G. Ellis, T. B. Brooks, H. V. Wade, G. Rice, T. Usher, D. D. Murphy, and three visitors.

Hon. Secretary.—Mr. W. A. Sunman tendered his resignation as member and Hon. Secretary on account of ill-health. Mr. D. D. Murphy was appointed to the vacant position.

Branch Show.—Discussion of arrangements in connection with the annual show of the products of the district, to be held about the third week of March, occupied the whole of the evening.

Mount Remarkable, January 11.

Present—Messrs. A. Mitchell (Chairman), C. E. Jorgensen, T. P. Yates, H. B. Ewens, D. Roper, and T. H. Casley (Hon. Sec.).

Standard Bushel.—Request from Chamber of Commerce for standard sample of new season's wheat received too late for attention. Members are of opinion that the producers should be represented through the Agricultural Bureau in the fixing of the standard for the season.

Potatoes.—Mr. G. Yates tabled splendid sample of Early Rose potatoes from seed procured from New South Wales. The potatoes were planted in a shallow trench and covered with straw, yard litter, &c., no manure being used.

Cherry Gardens, January 9.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, C. Lewis, J. Lewis, A. Broadbent, G. Brumby, E. Wright, and C. Ricks (Hon. Sec.).

Rabbits.—Mr. Jacobs called attention to the spread of rabbits in the district. Members were agreed that they had become a serious menace to the producers, being very prevalent in most parts. The Chairman stated that the

Clarendon District Council intended at an early date to enforce the Act in regard to the destruction of rabbits. Mr. Jacobs instanced one case where land which a few years ago kept sixty head of cattle was now only keeping twenty-four head of cows, producing only 8galls. of milk per day. The Hon. Secretary thought the only remedy was for a number of the settlers to combine to rabbit-proof fence their holdings and destroy the rabbits inside by systematic effort. It was impossible for each of the small holders to enclose his block, as the expense would be ruinous and also unnecessary. At one time it was confidently asserted that the natural enemies and local conditions would prevent the rabbits becoming a serious trouble in the hills, but they could now only hope to keep them down to reasonable numbers.

Watervale, January 8.

Present—Messrs. C. A. Sobels (Chairman), J. Thomas, H. Scovell, S. Solly, W. Smith, H. Beck, L. Buring, H. Croft, B. Perrin, G. Hunter, and E. Treloar (Hon. Sec.).

EXHIBITS.—Mr. Treloar tabled splendid clean samples of Moorpark and Montgamet apricots. Mr. Hunter showed fine early Kelsey plums and mammoth lettuce grown from Bureau seed, of very inferior quality.

BAGS AS WHEAT.—A long discussion on this subject took place, it being considered very unfair to charge 7d. each for bags and pay only 1½d. when buying the wheat bags in. Members thought the S.A. Farmers' Union should be the first to move in stopping this injustice, and it was resolved that the Farmers' Union should, in the interests of the farmers, approach the farmers and merchants with a view to getting wheat bags at half price.

BRANCH SHOW.—It was decided to hold the annual fruit, flower, and produce show in connection with the Branch on March 14.

Stockport, January 15.

Present—Messrs. G. Burdon (Chairman), D. G. Stribling, C. W. Smith, J. Smith, J. Smith, jun., T. Megaw, J. F. Godfrey, F. Watts, T. Howard, S. Smith, W. Barker, J. Murray (Hon. Sec.), and two visitors.

MANURES AND HARVEST RETURNS.—Members reported on late harvest and results from use of manures. Mr. C. W. Smith had best results—16½bush. per acre—from 80lbs. English super. drilled in some time before the wheat was sown, the seed being drilled in across the manure lines. Seed and manure drilled in together did not give such good returns. Frost damaged crop on black land and low spots. Average returns about 14bush., but that put in without any manure gave only 6bush. Mr. Godfrey used Thomas phosphate. With Dart's Imperial wheat he got 190 bags from thirty-three acres; Early Para, seventy-five bags from sixteen acres; Red Straw, on apparently the best land, gave poorest returns. He considered Thomas phosphate would give good returns on poor red lands in their district, but would not pay to use on good black ground. Mr. E. Watts used English super. and Althorpes guano broadcasted. The former gave 15bush., the latter about 9bush., but the super. had a better chance, the crop being sown under better conditions. Mr. Megaw scarified ½cwt. Thomas phosphate and ½bush. wheat on stubble land, and got about 15cwts. hay per acre; on fallow land, with 60lbs. of the manure, he obtained 16bush. per acre, another piece going 10bush. Mr. Barker used super. mixed with guano to get it to run through the drill. He used 4 tons on 110 acres; seed, ¾bush. per acre. Red Straw wheat was very thin, owing, he thought, to the mice getting at the seed; Dart's Imperial was much better. He had a lot of "black rust" in his crops. Mr. J. Smith drilled in 1cwt. per acre of English super. and Kangaroo Brand guano. The former gave best returns, 108 bags seed being obtained from twenty-three acres, after cutting strip half a chain wide all round for hay. Taking the whole area he averaged about four bags. Mr. D. G. Stribling used both English super. and Thomas phosphate, the former going very badly through the drill. Early Para cut 1¼ tons to 2 tons hay per acre, that left for wheat going 12bush., the grain being much shrivelled; Purple Straw gave 12bush.: some land not cropped for six years, and manured with 1cwt. Thomas phosphate, only yielded 13bush. per acre. He thought the frosts were the cause of the poorness of the returns compared with the appearance of the crops. Twenty-two acres of barley, with 1cwt. Thomas phosphate per acre, yielded 100 bags.

Poultry Complaint.—Member reported that some of his young fowls get weak in the legs, mope about for a day or two, then die.

Cradock, January 13.

Present—Messrs. R. Ruddock (Chairman), P. Gillick, W. Symons, W. Haggerty, B. Garnet, J. Turner, J. H. Iredell, T. Marsh, and J. H. Lindo (Hon. Sec.).

Quorn Conference.—The General Secretary wrote that members of the Bureau attending various Conferences could obtain return railway tickets at single fares on presentation to the railway stationmaster of certificate of membership from Central Bureau. Several delegates were appointed to attend the Conference, and Mr. Iredell promised to provide a parcel of fruit and vegetables grown in his garden at Cradock under irrigation.

Horse-breeding.—Mr. Gillick called attention to statement in paper read at December meeting of Wilmington Branch that breeding from a blood entire and a draught mare had but few good results. He took exception to this, as in his opinion this was the best way of procuring the most useful farm horse for their work. The sire gave courage, action, pace, and stamina, while the dam gave form, strength, and temper. In the north of Ireland hundreds of horses were raised annually from draught mares by blood stallions, and were bought for artillery work, while for cavalry purposes a further cross with the thoroughbred sire was used.

Wilmington, January 16.

Present—Messrs. J. Hutchens (Chairman), C. Baeker, J. Hannagan, M Gray, W. Slee, J. M. McLeod, J. Zimmermann, T. H. Harris, J. Lauterbach, H. Noll, A. Maslin, R. G. S. Payne (Hon. Sec.); and H. B. Welch, of Port Pirie Branch.

Exhibits.—Mr. Zimmermann tabled specimens of native curculio beetles, and the Hon. Secretary advised him as to remedies. Mr. Zimmermann also tabled simple improvement of his own make on the "butterfly sprayer" for distributing water. He had used this for three years, and had no need to effect any repairs.

Rabbit Destruction.—The Chairman reported very satisfactory results from use of phosphorus mixed with pollard and sugar for rabbits. He had been using it freely, and there were very few rabbits left on his land. Mr. Gray called attention to use of cyanide of potassium for poisoning rabbits, and promised a few notes on the subject for next meeting.

Carriage of Stock.—Mr. Welch called attention to efforts being made by Port Pirie Branch to secure a special truck weekly for carriage to Port Adelaide at reduced rates of calves, pigs, lambs, and sheep. Members thought the matter worthy of the attention of the Conference to be held at Quorn. The question of trucking yards at Bruce was also suggested for consideration at the Conference.

Fruit Culture.—The Hon. Secretary read a short paper on this subject, and promised to give same at Quorn Conference. Mr. Harris said his young apricot trees were dying off. Other members reported same experience. The Hon. Secretary said the same trouble was experienced in many places in the South. Mr. Harris stated that his orange trees had suffered considerably lately, dying off from the top. The Hon. Secretary thought the most probable cause was that the subsoil was unsuitable or had not been broken up properly, and as the main roots could not penetrate the soil the demands of the heavy top growth for nourishment could not be met. Citrus fruits required a good deep loamy soil or an equivalent working and fertilisation of the subsoil.

Tatiara, January 13.

Present—Messrs. W. Fisher (Chairman), F. Smith, D. Makin, G. Milne, J. Rankine, and F. J. Green (Hon. Sec.)

Standard Bushel.—The Hon. Secretary stated that he had complied with the request of the Chamber of Commerce for average sample of new season's wheat sold in local market at full rates.

South-Eastern Conference.—Lucindale Branch advised that the annual Conference of South-Eastern Branches would be held at Lucindale on March 15. Several members promised to attend the Conference.

Peas.—The Chairman initiated a discussion on—Can peas be profitably grown in this district? He had secured very good results from peas manured with superphosphate; the main obstacle was the difficulty of harvesting. For feeding pigs—the purpose for which he grew peas—he found the best way was to rake the crop together by means of the harrows, and stack in a convenient place where the pigs could be turned in to help themselves. As a pig feed he preferred peas to anything else; 1bush. peas was quite equal to 1¼bush. wheat. Mr. Rankine tried peas this year, but though the haulms were good and well podded, the pods were empty. Mr. Milne tried pea-growing for several years, but never secured a profitable return until he put the seed in with the drill and used super. and other fertilisers. He thought peas could be grown profitably in this district by the aid of the drill and manure, and there was the additional advantage that the land on which a pea crop had been grown was much improved for the growth of cereals.

Bute, January 9.

Present—Messrs. W. H. Sharman (Chairman), A. Schroeter, H. Schroeter, W. Hamdorf, D. Green, W. S. Sluggett, J. H. Barnes, A. Lamshed, M. Stevens, B. Commons, and M. Hall (Hon. Sec.).

Harvest.—Members were of opinion that the wheat yield for the district would not average more than 3½bush. per acre.

Conference.—Arrangements in connection with the Conference of Northern Yorke's Peninsula Branches, to be held on February 21, were dealt with.

Wheat Experiments.—Mr. D. Green tabled several samples of wheats, including Straight Vote, Kirby, Field Marshal, Waroo, Nonpareil, and a cross between Steinwedel and King's Early.

Yorketown, January 13.

Present—Messrs. J. Koth (Chairman), C. Domaschenz, J. H. Thomas, G. Bull, and J. Davey (Hon. Sec.).

FORESTRY.—Some members offered to raise sugar gums from seed for free distribution amongst their fellow members.

HARVEST.—Members reported that the crops generally in this district had been very light.

Wandearah, January 17.

Present—Messrs. G. Robertson (Chairman), W. Roberts, E. H. Eagle, J. Kurl, G. Collins, J. Wall, R. J. Dennis, and C. E. Birks (Hon. Sec.).

MODIOLA DECUMBENS.—A few seeds of this plant were received from central office. Members desired to know its nature, and will try to grow it. [This is a plant which is highly spoken of as a prolific fodder, said to excel our saltbushes in value. It is grown on alkali soils in California, and may perhaps confirm the reputation which it bears in that country.—GEN. SEC.]

"THE FARMER'S TABLE."—In discussing this subject it was shown that in this district most farmers could select low-lying land, where the rainwater would naturally flow, and grow sufficient fruit and vegetables for home use, but perhaps not for marketing. It would be necessary to select varieties in both lines that are suitable for growth in this dry locality.

Mount Gambier, January 13.

Present—Messrs. M. C. Wilson (in the chair), A. J. Wedd, D. Norman, sen., J. C. Ruwoldt, T. H. Williams, W. Mitchell, T. Edwards, and E. Lewis (Hon. Sec.).

CONFERENCE.—Hon. Secretary, Lucindale Branch, wrote *re* Conference of South-East Branches, to be holden there on March 15.

GRASS FIRES.—A great many suggestions were made with respect to methods of stopping the spread of grass fires. Ploughing strips both sides of fences have been practised by some people, but leave must be obtained from district councils to plough on roads, and in some cases those who have done so without leave have been warned not to offend again. Burning of strips and on roads was mentioned, but care would have to be taken to extinguish fires in hollow logs. Some thought that the district councils should plough up the roads or otherwise destroy the grass at intervals of a mile or two miles, but it was objected that sparks were blown a distance of six chains during the late fire (when a gale was blowing), and a bare strip of two chains (width of a road) would not be sufficient in such case, which, however, does not often occur. It was rumored that the late fire was caused by a railway engine, and Mr. Ruwoldt said he knew there were two fires recently caused by the same agency. Mr. Dyke said each farmer ought to guard his own property, and it would be a good thing to plant rape or some other crop that would keep green during summer. It was resolved to request the police to investigate the cause of the late fire.

BOTFLY.—Mr. Williams said he had found botflies in the district since last meeting. Mr. Mitchell said it had been about Strathdownie for some time. Mr. Wedd had seen it two years ago at his place. He was driving home and could not think what was the matter with his horses. They huddled together with their heads over each others' shoulders. He suspected the botfly, and found that every horse had been attacked under the jaw. He killed the nits by applying kerosene. A person might be working his horses, and yet not know they were attacked unless he looked. Mr. Williams said the district was most favorable for the propagation of the fly. The bots came away in the droppings from the horse, and they at once burrow in the soil, pupate, and emerge as perfect botflies. Mr. Wedd said stable-fed horses are most damaged by these flies. They rub the eggs or nits off their jaws into the manger with the food, and thus they obtain entrance into the stomach, where they generally remain eight to nine months. Mr. Williams said no remedy is known for bots when they are in the stomach of a horse, because anything that would destroy the bots would kill the horse. The hair should be cut off below the jaw and around the fetlocks. Kerosene should be rubbed wherever the horse can reach with his mouth, and a constant watch should be maintained for the attacks of the fly. Mr. Wedd said for two years he had not lost a horse. Under the jaw seemed to be a favorite place to deposit the eggs, and sometimes under the fetlocks.

WOOL-CLASSING.—The Hon. Secretary said Mr. G. Jeffrey had formed a class at Mount Gambier.

Port Germein, January 15.

Present—Messrs. J. Stone (Chairman), W. Head, J. K. Deer, W. Crittenden, C. O'Loughlin, and A. H. Thomas (Hon. Sec.).

RE BULLS.—It was decided that it is not advisable to allow the bull to run with dairy cows, because the cows may get in calf within six or nine months after last calving, and the milking period and quantity of milk for the season will be shortened.

SAMPLES OF WHEAT.—Mr. Crittenden showed samples of Indian King wheat from seed sent from Central Bureau. It was sown May 4, and reaped November 20, giving 30lbs. from a very small parcel; was of average quality, but flinty character, weighing 67lbs. per bushel. Mr. Stone showed Bartlett's Crossbred wheat, grown from seed sent by Central Bureau. The sample is inferior, with a small ear, very loose in the chaff, shakes out very easily. It is worthy of further trial. He also showed several other samples of wheats. He considers the early wheats only are suitable for the north.

Mount Compass, January 12.

Present—Messrs. M. Jacobs (Chairman), R. Peters, R. Cameron, F. Slater, W. Gowling, C. S. Hancock, J. Jenkens, and A. J. Hancock (Hon. Sec.)

SEASONABLE OPERATIONS.—Sow peas, cabbage, turnips, swedes, and green fodders. Plant potatoes.

PRACTICAL QUESTION.—Mr. Jenkens wants to know why his apple trees, planted two years, have made no progress whatever, although they have been manured with straw, litter, and peat. [Impossible to tell without a personal knowledge of all the circumstances.—GEN. SEC.] Mr. Jenkens wished to know whether there is any poisonous principle in the foliage of the everlasting flowers. The stomachs of sheep eating it are lined with a thick woolly substance and with particles of the plant. [The whole of the plant is covered with a dense tomentum or woolly felt, which becomes attached to the lining of the stomach and prevents the proper action of the gastric juices. The tomentum often becomes felted, and forms "balls of hair," which stop the action of the intestines, &c., and the animal dies.—GEN. SEC.] Mr. Jacobs wants a remedy for the small flies that attack many kinds of vegetable crops. [Send some down for identification. Possibly a remedy can then be suggested. —GEN. SEC.]

VISIT TO THE BLOCKS.—Prior to the meeting the members had spent the day in visiting the Mount Compass garden blocks. The first visit was to Mr. Gowling's, whose early potatoes were poor, but the later crops looked better. The fruit trees, three years planted, were 8ft. to 9ft. high, and looked well. After passing through Mr. W. Way's blocks Mr. M. Jacobs' onions, sown by the drill, were very patchy, and a poor crop; early potatoes poor also, but the late crop was more promising. Mr. Jacobs uncovered three new varieties of potatoes, second year's crop, sent up by the Chairman of Central Bureau (Mr. F. Krichauff). The plants were rank, and the tubers very small. A new "Imperial Hillside Plough" was inspected, which promises to do good work on the swamp lands for ploughing in potatoes as well as for ploughing them out when ripe. Mr. S. Arthur's potato crops were looking very healthy. Some potatoes in Mr. G. Way's block were the best yet seen. Messrs. Wright Brothers have from ten to eleven acres under vegetables of all kinds; the transplanted onions were very good, and late potatoes about average. Commercial fertilisers appear to give good results here. Mr. Slater's flower garden was much admired. Late potatoes, not earthed up as an experiment, were looking fairly good. Raspberries have done remarkably well with this gardener. Mr. Hutton had planted onions too thickly on his ground, but they were doing fairly well. Finally, after looking over Mr. Slater's block the visitors had tea at his place, and cordial votes of thanks were accorded.

Lucindale, January 20.

Present—Messrs. E. Feuerheerdt (Chairman), A. Carmichael. J. Bourne, J. Riddoch, H. Langberg, G. C. Newman, W. Dowe, Eb. Hall, A. Matheson, B. A. Feuerheerdt, E. E. Dutton (Hon. Sec.), and one visitor.

CONFERENCE—Correspondence received respecting Conference of South-Eastern Branches to be holden at Lucindale on March 15. The Chairman expressed disappointment that the various Branches failed to state approval of the date fixed upon, or to state that they would co-operate.

EAR-MARKING SHEEP.—Mr. C. G. Newman read the following paper:—

Nearly every landholder in this district is interested in the ear-marking of sheep, but it is at present carried out in a very unsatisfactory manner, as any number of persons in the same district may use the same mark; and there is no law to prevent a man ear-marking his sheep in exactly the same way as his neighbor. I can give an instance that came under my notice last year at dipping time. With the sheep we were dipping were a few that had got in from adjoining paddocks and owned by two persons (judging by the paint brands), both having the same earmark; and one flock we were dipping was marked the same way. One owner of those sheep has land joining the other two, and in case of his sheep getting into his neighbors' paddocks, or *vice versâ*, the chances are that unless the paint brand was distinct—which is often not the case by shearing time—the rightful owner would stand a good chance of having his sheep shorn and branded by his neighbor, and would not, after that, be able to identify them if they saw them.

As we only had sheep belonging to five owners in the yards, and three of them marked their sheep alike, and possibly others in this district use the same mark, it shows that the earmark, under present conditions, is a very poor means of identification. I have known sheepowners keep several breeds of sheep and have a different earmark for each breed, besides an age mark; and I doubt whether they could recognise all their marks without a reference to the studbook.

To amend this state of affairs, I consider it necessary that there should be legislation on the subject, and that sheepowners should not be allowed to earmark sheep without first registering that mark. I am not prepared to advocate any size for a district, but if it proved unworkable, to have the districts as large as they are for paint brands, *i.e.*, Central, South-East, Port Lincoln, and Kangaroo Island. They might be made to correspond with the electoral districts for the House of Assembly. At the present time we must register an earmark before we can use it on cattle that probably carry a fire brand that cannot be got rid of; and if that is necessary for the prevention of dishonesty, how much more so in the case of sheep, where all traces of the brand are removed with the wool. I think all will admit experiencing a difficulty in finding the owners of strange sheep at shearing time, owing to the paint brands being indistinct. That difficulty would to a great extent be overcome if the earmark was registered, as a reference to the Brands Directory would show who bred the sheep.

Mr. Hall thought it would be necessary to have small districts for registration of earmarks, else all the marks would be used up. Mr. B. A. Feuerheerdt advocated use of tattoo earmarks, to be registered, and this would give a much greater number of patterns of earmarks. It was finally resolved to communicate with the Chief Inspector of Stock and Brands.

Finniss, January 8.

Present—Messrs. T. Collett (Chairman), W. W. Heath, J. Chibnall, P. Gooding, S. Eagle, A. E. Henley, H. Langrehr, and S. Collett (Hon. Sec.).

BAMBOO.—Some discussion took place on growing the giant bamboo in this district, and members wished to know if it has any commercial value, and whether it would grow on salty soil. [It is of much value, but will not grow on salty soils.—GEN. SEC.]

STOCK COMPLAINT.—Mr. Heath reported having lost a cow from some unknown cause. The glands of the throat swelled considerably and the tongue protruded, death resulting in about twenty-four hours. Members wished to know cause of trouble and treatment recommended. [Possibly snakebite. If so, no cure.—GEN. SEC.]

Norton's Summit, December 16.

Present—Messrs. J. Jennings (Chairman), A. Smith, John Hank, C. W. Giles, and W. H. Osborne (Hon. Sec.).

FRUITFLY.—Members wished to know whether it was correct that New South Wales has prohibited the importation of Queensland tomatoes because of the impossibility of detecting the presence of the fruitfly, and if so, are any other fruits prohibited. [The Bureau officers have no knowledge of any such prohibition, though there has been some talk about it, not because of the impossibility of detecting the presence of the maggots of the fruitfly, but because the tomatoes were found to be badly infested.—GEN. SEC.]

Golden Grove, January 13.

Present—Messrs. T. G. McPharlin (Chairman), S. Milne. J. Woodhead, J. Anderson, J. R. Smart, F. Buder, J. Ross, W. Smith, A. Robertson, and A. Harper (Hon. Sec.).

MANURING TOMATOES.—Mr. Smart asked what was the best manure to bring tomatoes to perfection. Members thought watering with water containing sulphate of ammonia would be best. [American experience is to the effect that tomatoes do well in land dressed with mineral fertilisers, and that to bring the fruit to maturity early dressings of nitrate of soda at rate of 80lbs. to 100lbs. per acre at setting out and about four weeks later give better results in light soil than any other nitrogenous fertiliser.—GEN. SEC.]

SORGHUM FOR COWS.—Mr. Ross wished to know most profitable manner to feed sorghum to cows. Members thought that if the crop were a good one it was better to cut and feed it to the cows than to let them graze it.

CODLIN MOTH.—Mr. Buder tabled two codlin caterpillars; he found the first caterpillars this season in September, and the second brood about first week in January. He believed there were three broods during the season.

Licensing Stallions.—Mr. Ross asked what good it would be to license stallions travelling for hire when many animals passed by the veterinary surgeon as sound would leave no foals. Mr. Woodhead was in favor of licensing, and would cast out all that were unsound. [The question of licensing stallions to prevent breeding from unsound horses has nothing to do with the question of whether such horses would get foals or not, the latter depending very largley upon the management of the stallion and mare.– Gen. Sec.]

Eudunda, January 15.

Present—Messrs. J. von Bertouch (Chairman), C. Wainwright, H. D. Weil, A. Kluske, E. T. Kunoth, F. W. Paech, M.P., E. Schier, A. M. Twartz, J. A. Pfitzner, C. L. E. Lutz, and W. H. Marshall.

Membership and Officers.—The resignation of Mr. J. W. Kriebel, one of the foundation members of the Branch, was accepted with regret. Mr. W. H. Marshall was elected Hon. Secretary.

Experimental Work.—Mr. Kluske tabled an interesting report on experiments carried out by himself. Bartlett's Crossbred wheat yielded 7bush. per acre, it is very early, but does not stool well, and also suffered badly from frost this year; Indian King gave 6bush., and they were both worth about 10cwt. of hay per acre.; Purple straw yielded 15bush., and cut 1 ton 15cwts. hay per acre. All wheats were sown on May 10, on fallow land, with 95lbs. bonedust and 250lbs. sheep manure. Mr. Kluske tabled samples of Dhurra, Farmer's Friend, Amber cane, Sorghum, and Johnson grass, grown on the experimental block under control of the Branch. The samples were very good considering the dryness of the season, the Amber cane being over 3ft. high. Excepting Johnson grass the seed was put in on fallow land, manured with Thomas phosphate and sheep manure. The Johnson grass was sown in 1893-4, and all the cultivation required since was to scarify the land before the spring rains. This broke the roots up into small pieces, each of which threw up several stems during the summer, producing a good crop of green feed. He did not find the wheat crop interfered with, as the grass made no growth during the winter. Mr. Kluske said he would not be without his summer crops of green feed for anything. His cows were very fond of it, and did well. A number of questions were asked and answered, and a vote of thanks accorded to Mr. Kluske for his report. Mr. Kluske stated that the drilled crops had on an average yielded 4bush. to 6bush. per acre more than those broadcasted. Mr. Twartz reported that he sowed Bartlett's Crossbred, Early Para, and Steinwedel, all early varieties, on June 22, and up to October 22 the first-named was far ahead of the others. As the October frost and winds killed all three he could not say which would yield best. Some Early Para he obtained from Professor Lowrie in 1898 yielded 3bush. from 15lbs. sown; this sown again yielded six bags.

Gawler River, January 19.

Present—Messrs. A. M. Dawkins (Chairman), R. Badcock, J. Hillier, J. Barrett, F. Roediger, A. Bray, D. Humphries, C. Leak, T. P. Parker, J. Badman, H. Roediger (Hon. Sec.), and one visitor.

Stock Complaints.—Chairman reported visit by stock inspector to inspect cows suffering from some disease. Two were suspected to be affected by tuberculosis, and would be watched carefully. It was decided to ask the stock inspector to visit the district later on, and give a practical demonstration in the use of tuberculin. Mr. Humphries reported having lost two-thirds of his fowls, the symptoms of the disease being mopishness for a day or two, the comb becoming black, and death ensuing soon afterwards. Mr. Hillier had cured fowls suffering from diarrhœa by giving flour boiled in milk to a fairly thick consistency.

Harvest Results.—The Chairman reported that a crop of King's Early wheat, manured with 1cwt. guano super., yielded 21bush per acre, against 12bush. from unmanured crop; he also stated that some land manured three years ago with bonedust still showed the good effect of the manure. Mr. F. Roediger found better results from manure on light soils than on the heavier classes; bonedust and super. mixed gave better results than bonedust alone. Mr. Barrett used bonedust and had a good crop, also a good crop of oats on light sandy soil manured with Thomas phosphate. Mr. Badcock got double the return from crop manured with Thomas phosphate than from unmanured crop. Mr. Badman had similar results from this manure. Most members favored Purple Straw for wheat, and next King's Early, the latter and Tuscan being preferred for hay. Early Para was not considered suitable for this district, as, in addition to being weak in the straw, it was very subject to black rust and bunt. Members who had sown Petatz Surprise were not favorably impressed, but Dart's Imperial was well spoken of, both for wheat and hay.

Brinkworth, January 11.

Present—Messrs. G. Freebairn (Chairman), S. Aunger, J. F. Everett, A. L. McEwin, and J. Stott (Hon. Sec.).

Conference.—It was decided that the members forward to Gladstone and Bute Conferences as many exhibits as possible of wheats. Mr. Freebairn agreed to open a discussion on experience with artificial manures during the past season.

Quorn, January 17.

Present—Messrs. R. Thompson (Chairman), F. Herde, James Cook, C. Potter, H. S. Stacey, and A. F. Noll (Hon. Sec.).

Conference.—The Hon. Secretary reported that the Conference of Far Northern Branches, to be held at Quorn, on February 16, promised to be a great success. They had promise of representatives from twelve Branches as well as from the Central Bureau. Professor Lowrie and Mr. G. S. Thomson, Dairy Instructor, had promised to give papers, while several members of Branches had also offered papers. Several of the Branches had also promised to bring exhibits of products to the Conference.

Wilson, January 13.

Present—Messrs. D. McNeil (Chairman), W. H. Neal, R. Rowe, H. Need, H. T. Crossman, A. Canning (Hon. Sec.), and one visitor.

Bags as Wheat.—Some discussion took place on the arrangements between the wheatbuyer and the farmer in regard to bags. Members consider the present practice most unfair to the farmer, as the bags as secondhand would be worth far more than the farmer receives for them when selling his wheat.

Insect Pest.—Mr. Need reported that considerable damage was being done in places to the black oaks by grubs, a number of trees having been killed. Members were recommended to use tar when the trees attacked are of any value.

Harrowing Cereal Crops.—A member inquired whether harrowing the land after the wheat was up was recommended, and if so, when was the best time to do the work. Mr. Rowe thought the crop should be harrowed when a few inches high and well rooted, using light, sharp harrows. A few plants would be pulled up by the operation, but plenty would be left and the crop would benefit. Mr. Crossman pointed out that harrowing the growing crop was not always profitable. Members were of opinion that harrowing too early would do more harm than good.

White Ants.—In reply to question as to best means of destroying white ants attacking the roots of fruit trees, one member stated that he had used with immediate success a solution of cyanide of potassium.

Renmark, January 11.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, R. Kelly, E. E. Dutton, H. Swiney, and E. Taylor (Hon. Sec.).

Officers and Rules.—Messrs. W. H Waters, Captain Moffatt, and E. Taylor were re-elected Chairman, Vice-chairman, and Hon. Secretary respectively. Suggested rules from General Secretary were discussed at length, and it was decided to adhere as far as possible to these rules, and to make a vigorous effort to import more life into the Branch. [Copies of suggested rules for conduct of Branches can he had on application —Gen. Sec.]

Sun-burnt Grapes.—Members reported that the grapes on the Gordo Blanco vines were in many cases drying up. Some discussion ensued, the cause of the trouble being generally attributed to the excessive hot winds experienced this season.

Minlaton, January 20.

Present—Messrs. J. McKenzie (Chairman), A. McKenzie, D. G. Teichelmann, W. Correll, R. Higgins, Jas. Martin, Jno. Anderson, and Jos. Correll. (Hon. Sec.).

Forestry.—It was decided to accept offer of seed for forest trees to be raised by one or two members for free distribution to other members.

Manuring and Experiments.—Mr. A. McKenzie stated that he used some Acme fertiliser with his wheat, but could absolutely see no benefit from its use. The article was manufactured at Edithburgh. The Hon. Secretary said the analysis furnished by the vendors showed that the stuff was of no practical value as a phosphatic fertiliser, containing as it did only 6·5 per cent. of phosphoric acid, and purchasers had only themselves to blame for the unsatisfactory results. Mr. W. Correll reported that 20lbs. per acre of sulphate of potash mixed with Thomas phosphate gave 5bush. per acre better result than Thomas phosphate alone. His previous experiments had shown that the direct application of potash to the wheat crop had no effect, but he thought possibly the mixing of the sulphate of potash with the phosphate may have had a beneficial effect on the latter. The Hon. Secretary said he had been in correspondence with Professor Lowrie on the matter, and he suggested it was more likely that the presence of carbonate of soda in the soil made the Thomas phosphate more insoluble, while possibly the addition of sulphate of potash would have the effect of rendering the carbonate of soda less harmful. If this was so, calcined gypsum would be beneficial; but experiments would be necessary to prove this. The Hon. Secretary also reported that from 5bush. Petatz Surprise wheat he obtained 144bush., equal to 19·8bush. per acre.

The wheat was a very early variety, stood up well, tillered well, and weighed well, his sample going 68¼lbs. per bushel. King's Early had also done well. Danish Island oats had again turned out well, seven bags being taken off an acre. Surprise oats were late in ripening, but were worthy of further trial. Epp wheat grew very slowly at first, tillered wonderfully, but ripened very late; it might do better when acclimatised. A new variety, a selection from Purple Straw, sown at the rate of 15lbs. per acre, yielded at the rate of 22bush. About a dozen of his Medea Crossbreds promise well. Messrs. Correll Bros. stated they had for exchange or sale seed of Hawke's Clubhead, King's Early, and Petatz Surprise wheats, and wished to obtain good clean seed of Steinwedel.

Balaklava, January 20.

Present—Messrs. C. L. Reuter (in chair), E. Hains, A. Hillebrand, J. Vivian, G. Reid, W. H. Thompson, and E. M. Sage (Hon. Sec).

Visit to Homestead.—This meeting was held at the residence of the Hon. Secretary, at the Pinery. Dishes of Lord Nelson and Quarrendon apples, Californian Silver prune, Botan plum, Early Crawford peach, and Hunt's Tawny nectarines were tabled for the delection of the visitors. These were all grown on the place, and were of good quality. Members expressed surprise at the quality of the fruit, as they have been grown without irrigation on land considered to be amongst the poorest of the district. Members inspected the garden, and the methods of pruning and cultivation adopted were explained by Mr. Sage, who called special attention to the contrast between apricot trees manured, two years ago, with superphosphate and those unmanured. The trees were affected with what is commonly called "die-back," and were severly pruned. Those manured have since made splendid growth, but the others have a very sickly appearance, and some have died right out. Some Cleopatra apple trees, well laden with fruit, and looking very healthy, also came in for special attention. Members congratulated Mr. Sage on his success in growing fruit in this dry district, and thanked him for his lucid explanations of his methods of working.

Impaction.—Members reported that cows in this district were dying from impaction (dry bible). The Hon. Secretary stated that he always kept a mixture of salt and bonedust where his cow could help herself when she liked, and she ate on the average about 3lbs. of the mixture per week.

Grass Grubs.—Members reported that grubs were eating the dry feed, the ground eaten off being left covered with a matted web, like a spider's. Only land that has been spelled for several years appears to be affected. The grubs feed in the night, but hide about 6in. below the surface during the daytime.

Pine Forest, January 9.

Present—Messrs. W. H. Jettner (Chairman), J. Phillis, J. St. J. Mudge, J. Flowers, A. Inkster, G. Inkster, E. Masters, and F. Masters.

Harvest Returns.—Some members absent from previous meeting took exception to statement that in no instance were returns of less than 8bush. known to have been obtained in this district from manured fallow land. Several cases where only 2bush. to 3bush. per acre were obtained from such land were quoted.

Annual Report.—The Hon. Secretary's Annual Report showed that during the past year eight meetings were held, with an average attendance of 6·5 members. Papers on Shelter for Stock, and Lessons from the Drought had been read, and numerous practical matters discussed. Owing to the dry season Arbor Day was not celebrated, and the usual produce and industrial show in connection with the neighboring Branches was not held. The total rainfall for the year was 9·65in in this district, and, under such adverse circumstances, the difficulties of the husbandman have been great. Messrs. R. Barr, jun. and F. Masters were elected Chairman and Hon. Secretary respectively.

Crystal Brook, January 16.

Present—Messrs. G. Davidson (Chairman), G. Miell, A. Hamlyn, and G. Scott (Hon. Sec.).

HON. SECRETARY.—Mr. Scott tendered his resignation as member and Hon. Secretary, as he was leaving the district. Members regretted loss of Mr. Scott's services. Mr. Geo. Mill agreed to act as Hon. Secretary for the present.

Port Pirie, January 13.

Present—Messrs. E. J. Hector (in chair), W. Wood, T. Gambrell, A. Wilson, H. B. Welch, T. Johns, J. Humphris, G. M. Wright, G. Hannan, T. Jose, W. Smith, W. K. Mallyon, and R. J. Ferry (Hon. Sec.).

CONFERENCES.—Resolved to attend Conference at Gladstone, but members consider Bute Conference to be outside the limit.

EMEX AUSTRALIS.—The General Secretary wrote that as "three-cornered Jacks" (Emex australis) is a plant so extensively existent all over the colony, it was considered to be undesirable to have it declared a noxious weed under the Act.

CARRIAGE OF LIVE STOCK.—A committee was appointed to draw up suggestions for consideration at the Gladstone Conference with respect to carriage of live stock on the railway lines.

EXHIBITS.—Mr. Hector tabled very large specimens of Lord Nelson apple, 4¼in. diameter and 2½in. deep. These were grown by himself, and the orchard had been heavily flooded during the winter.

Lyrup, June 9.

Messrs. T. Nolan (Chairman), W. Healy, D. J. Tree, O. Klemm, W. H. Walling, A. Pomeroy, J. Sykes, D. Thayne, T. R. Brown, G. A. Bollenhagen, A. Menzies, A. Weaver, W. H. Wilson (Hon. Sec.), and five visitors.

RAINFALL.—December, nil; for year 1899, 9·76in.; for 1898, 7·29in.

EXHIBITS.—Vine leaves, 12½in. x 11in., useful for wrapping peaches, by A. Menzies; fair quality potatoes, by O. Klemm. Good but medium size tomatoes, from seed sent up from Agricultural Bureau, name lost, by J. Sykes. Gypsum, by Mr. Thayne. Members wish to learn what is its value. [Gypsum is worth about 22s. per ton delivered in Adelaide. If calcined or crushed fine, it is worth a little more, and is very useful for preventing bad odors in stable manure, earth closets, pigsties, &c.—GEN. SEC.].

PUMPKINS.—Mr. Menzies tabled a pumpkin weighing 35lbs., and dilated on the necessity of thoroughly working land before sowing seed, and the importance of sowing seed at the right time.

Koolunga, January 19.

Present—Messrs. T. B. Butcher (Chairman), J. Jones, J. Sandow, E. J. Shipway, J. Button, J. Freeman, W. T. Cooper, R. Lawrie, W. J. Jose, J. Butterfield, J. Pengilly, and G. Pennyfield (Hon. Sec.).

CONFERENCES.—Members decided to be represented at Gladstone and Bute Conferences.

THE BAGS-IN QUESTION.—Members generally favor the present system of selling the bags as weighed in with grain, because farmers know exactly what they are paying for the bags, and can take their grain wherever they please to sell it. Under the old system, farmers doubtless had to pay for the bags by accepting a lower price for their wheat, and the "bag account" was often the cause of much unpleasantness with the agents and merchants.

HARVEST RETURN.—The estimated average wheat yield for this district is 8bush. per acre. Very little was cut for hay.

Naracoorte, January 13.

Present—Messrs. S. Schinckel (Chairman), Oliver Hunt, J. Wynes, D. McInnes, E. C. Bates, and G. Greenham (Hon. Sec.).

AGRICULTURAL CLASSES.—A lengthy letter from the Hon. Secretary of Clare Branch (Mr. H. J. Yelland) was read, giving particulars concerning the agricultural class, conducted at the public school at Clare. The class was merely an experiment, and if successful would probably be extended in scope. The play-shed was used in place of a laboratory, and chemistry experiments could be conducted in the classroom for chemistry. The carpentry class had made a cabinet for storage of chemicals and tools used by the classes. The agricultural class had seven square chains of land under crops with various fertilisers. Other plots were under vegetables, and a number of fruit trees and vines had been planted. A nursery for fruit trees and vines had been established, and many of them will be grafted or budded next season. Mr. Greenham thought the Naracoorte school had not such good accommodation as that at Clare. He noticed three classes being conducted in one room. The Chairman had visited the class plots at Naracoorte a short time ago and found the fruit trees and vines doing well, but potatoes and sorghum did not promise much. After a good deal of discussion a vote of thanks was accorded Mr. Yelland.

IMPACTION OF OMASUM.—Some members are of the opinion that "dry bible" or impaction in cattle is universally found over Australia, and that it is not due to dry fibrous food. One said he had given his cows plenty of green food, used sulphate of iron, molasses, and various other preventives, and found them no good. He had relieved a cow with whisky, but she took the complaint again and died. Some thought perhaps the kidneys were partly responsible, but a member who had dissected some of the animals had found the kidneys sound, whilst the gall was often enlarged. The Chairman said it was evidently the impression of the Agricultural Department that the complaint was caused by the fibrous nature of the food, but the evidence brought forward that day showed that it was not the food. [Veterinary authorities say that impaction of the omasum in caused by dry, fibrous, innutritious food, and the material found impacted in the omasum always consists of dry fibrous matter.—GEN. SEC.]

BUDDING FRUIT TREES.—Mr. O. Hunt gave some particulars respecting the working of fruit trees. He raised his own stocks and budded or grafted them with the varieties wanted. He favored budding in lieu of grafting, and would always work peach on peach stocks and apricot on apricot stocks. The time for budding was from Christmas until the middle of February. By budding, the growth got a strong hold from the start, but grafts grew vigorously at first, and the wind was liable to blow them out. Anyone could learn the art of budding at once. He would like to see children raising stocks from pips and stones, and learning how to bud and graft. This would lead to a friendly rivalry amongst them, and they would be encouraged to take an interest in gardening. Mr. Hunt then gave a practical illustration of the art of budding, and explained every detail of the operation. He was thanked.

CODLIN MOTH.—After discussion, it was resolved to request that a competent inspector be appointed to visit orchards and gardens in the district, and to give advice as to best way to eradicate codlin moth.

Mundoora, January 12.

Present—Messrs. R. Harris (Chairman), T. Watt, W. Aitchison, C. Button, W. J. Shearer, W. D. Tonkin, D. Smith, W. Mitchell, A. E. Gardiner (Hon. Sec.), and C. E. Birks, of the Wandearah Branch.

EAR COCKLE.—Several members spoke in appreciative terms of the article and illustrations of ear cockle in the December, 1899, issue of the *Journal of Agriculture and Industry*, and all farmers were urged to be on the alert to prevent its introduction by means of seed wheat into the district.

RABBITS.—Members were recommemded to do everything possible to cope with the increasing number of rabbits. One member had tried "toxa," but although a number of the pests were killed there was too much food about to allow of it being highly successful.

TIMBER TREES.—A member wished to know if white mallee could be grown from seed. This was most useful for fencing purposes, and grows well on limestone soils. [White mallee can be grown quite readily from seeds, which should be gathered when the capsules are ripe, and spread on a tarpaulin in the sun to open the capsules. Watch the birds and ants, else all the seeds will be carried off.—GEN. SEC.]

Penola, January 13.

Present—Messrs. J. Fowler (Chairman), J. D. Wilson, J. W. H. Sandiford, J. T. Morris, L. W. Peake, E. A. Stoney, D. McKay, W. Miller, E. McBain, F. Ockley, R. Fowler (Hon. Sec.), and five visitors.

RAINFALL.—For year 1899, Penola, 21·05in.; Coonawarra, 21·35.

CODLIN MOTH.—Mr. Stoney reported on his attendance as a witness for the Codlin Moth Regulations Commission. He had to state that the codlin moth was unknown at Coonawarra, and to recommend the formation of fruit boards under the Vine, Fruit, and Vegetable Protection Act, having power to control proclaimed districts.

GENERAL AGRICULTURE.—Mr. McBain's paper on this subject was further discussed. Dr. Ockley thought it was a simple matter for anyone to experiment and find the relative value of different manures on their soils. Farmers should use the locally-made bonedust, which is equal in value to any other. Much of the land not privately owned was in no way fit for dairying. In reply to a question, Mr. McBain said phosphatic manures enabled land to produce crops with the aid of the potash and nitrogen already existing there, but without the addition of phosphates such crops could not be produced. Where there was abundance of nitrogen and potash present in the soil it would take a long time to exhaust it by the addition of phosphates and raising crops thereby.

BOTFLY.—It was mentioned that the botfly had appeared in the district.

RAPE V. SCOTCH THISTLES.—Dr. Ockley, referring to a statement made by a member of another Branch, that the best way to get rid of Scotch thistles was to sow the field with rape, said he could show a good crop of Scotch thistles growing where a crop of rape grew last season, and he had now a crop of rape and thistles growing together.

SPRAYING FRUIT TREES WHILST IN BLOOM.—Mr. Peake said he had read in a paper that a man spraying his trees whilst in bloom had killed all his neighbors' bees. [If any arsenical compounds are used for spraying fruit trees whilst in bloom it is probable that the blossom will be killed as well as the bees, &c. Bordeaux mixture does not appear to have any such effect.—GEN. SEC.]

OFFICE BEARERS.—Mr. E. A. Stoney was elected Chairman and Mr. Miller Vice-chairman. The Hon. Secretary retains his office. Retiring officers were thanked for their services.

Johnsburg, January 20.

Present—Messrs. F. W. Hombsch (Chairman), H. Napper, G. H. Dunn, H. Arnold, T. Thomas, T. A. Thomas, F. W. Smith, T. Johnson (Hon. Sec.), and one visitor.

QUORN CONFERENCE.—Several members promised to attend Conference to be held at Quorn on February 16.

WHEATS FOR DISTRICT.—Considerable discussion took place on best varieties of wheat to grow in this district. It was thought that some of the earlier varieties should be grown on account of the dry springs so often experienced. Early Para did not seem to give such good results as its appearance indicated, but Steinwedel, notwithstanding the loss from shaking out, did better than other varieties tried. Purple Straw is a good wheat for an ordinary season. Messrs. Thomas tabled samples of Bartlett's Crossbred and Indian King wheats grown from Bureau seed. The former showed a beautiful sample, the heads being well filled with good lengthy grain, and members thought the variety worthy of an extended trial; from 15lbs. of seed 3bush. 53lbs. grain were reaped. Indian King yielded 60lbs. from 4lbs. seed, but though nice and plump was of a flinty nature. It was reaped earlier than usual, owing to its showing a tendency to shake. Messrs. Thomas were asked to cultivate the varieties again on behalf of the Branch and report results.

STOCK COMPLAINTS.—Mr. B. Crabb showed a "calcareous" growth taken from the jaw of a horse. After the operation the wound exuded a quantity of perfectly clear fluid resembling water.

NECTARINES.—Messrs. Thomas tabled small branch containing cluster of fifteen nectarines, and members expressed surprise at the amount of fruit in such a small space of growth.

Morphett Vale, December 6.

Present—Messrs. L. F. Christie (Chairman), A. Pocock, J. Bain, F. Hutchinson, H. Anderson, T. Anderson, J. Spriggs, J. Depledge, and A. Ross Reid (Hon. Sec.).

BAGS AS WHEAT.—The Hon. Secretary initiated a discussion on selling bags as wheat. Although on the face of it there seemed to be an injustice in selling the farmer bags at 7d. and buying the wheat bags in, he considered a grievance was being made where none existed. If the buyers had to pay for the bags they would reduce the price per bushel for wheat, as they must make a fair price on their transactions. The price paid here was based upon the price obtainable in London, and allowance had to be made by the buyer for expenses in connection with handling and shipping wheat, and this necessarily included the cost of the bags. Other members agreed, and a resolution in favor of the present system was carried, it also being considered that the bags were too large, and that 3bush. bags should be used.

THATCHING STACKS.—Mr. Bain referred to the necessity of thatching haystacks as early as possible. Broken straw thatch would keep out the rain better than sheaved straw. He had a straw stack thatched in 1894, and it was as good to-day as ever. In thatching it was important to have a good slope and to use good pegs at each end; there should be a good roll of straw along the centre of the gable. Mr. Depledge recommended sheaved straw for thatching.

DART'S IMPERIAL WHEAT.—Mr. H. Anderson wished to know whether this variety was distinct from the variety known as "Bluey."

Redhill, January 15.

Present—Messrs. S. A. Treloar (Chairman), D. Steele, W. Steele, D. Lithgow, R. T. Nicholls, A. A. Robertson, R. B. P. Bayly, and T. McDonald (Hon. Sec.).

TAKEALL.—The Chairman called attention to discussion at several Branch meetings on this subject, and to the suggestion that an insect was the cause of the trouble. This was his own opinion, after giving careful attention to the subject for a number of years, he attributed "takeall" to the ravages of a small "grub," and the insects referred to were the flies of this "grub." It appeared essentially a wheat trouble, as he had never known it to exist where oats were grown. To get rid of it, or, at any rate, to reduce its ravages, he would advise leaving affected land out of cultivation for a few years. He has also noted that running sheep on the land when it was wet was beneficial, probably owing to the soil being consolidated and hardened. [There are two species of fungus at least which destroy the roots of wheat plants, and cause them to die off in circles or patches. Another cause for wheat plants dying in patches is hollow bed, caused by ploughing late, when the soil is too dry to pulverise, and the clods remain in the subsoil unbroken. Sometimes the larvæ (or grubs or caterpillars) of various insects eat the roots, and cause the plants to fail. But the disease properly known as "takeall" is undoubtedly caused by parasitic fungi of the lowest order.—GEN. SEC.]

Davenport, January 5.

Present—Messrs. W. J. Trembath (Chairman), F. B. Rathbone, J. E. Lecky, T. McDowell, J. Holdsworth, W. Hodshon, J. Roberts (Hon. Sec.), and two visitors.

CONFERENCE.—Several members promised to attend the Conference of Northern Branches at Quorn on February 16th.

POULTRY REARING.—Mr. G. Hadlow read a paper giving his two years' experience in poultry rearing. He had concluded that the business was decidedly a paying one. He commenced on January 1, 1898, with twenty mixed hens and one rooster. On December 3, 1899, he had thirty-five hens, twenty-five pullets and cockerels, seventy-eight chicks, forty-eight ducklings, six mature ducks, one rooster, and two turkey chicks—a total of 185, or an increase of 164 for twenty-four months. He had paid during that interval for bran, pollard, screenings, &c., £6 0s. 4d.; for medicines and dipping materials, 5s. 9d.; for twenty-two fowls, 16s. 6d.; and eggs, 38s. 9d. (some for re-sale); total, £9 1s. 4d. Receipts—For fowls and hen eggs, £20 14s. 10d.; for ducks and duck's eggs, £2 5s. 8d.; total, £23 0s. 6d., or a credit cash balance of £13 19s. 2d., besides the increase of 185, valued at 1s. 6d. each, or £13 17s. 6d. The average profit was £1 3s. 4d. per month. The cost of houses was not great, as he had utilised old galvanized iron and wire netting. The average working man could in spare time do all this work and add a respectable sum to his income, and there were many whose children could do most of the supervision of the poultry. He was of opinion that all-iron houses were best for poultry, as the interior could be partly filled with straw, &c., and burned, which would create sufficient heat to destroy all ticks and their eggs without injury to the house. He held the idea that weather had a good deal to do with the increase of ticks. [Once ticks get a hold they will continue to multiply whatever the weather may be.—Gen. Sec.] Cleanliness in every quarter and judicious feeding were essential to the good health of poultry. During 1899 he sold 290doz. of eggs for £11 5s. 8½d.—a trifle over 9¼d. per dozen. He had made some serious errors. He had penned pullets and a cockerel together, both sexes too young, with the result that they had weak progeny, liable to all sorts of complaints. During the twenty-four months he had lost by deaths seven hens, seventy-eight chicks, ninety-six ducklings, and three turkey chicks —total 184. Many of which were possibly due to mistakes in management.

Tomatoes.—The Chairman said he proposed to offer notes and comments upon subjects affecting the producing and industrial interests at each meeting, and invited all other members to do likewise. With regard to tomatoes, it is not advisable to supply the plants with large quantities of farmyard manure, as this is conducive to the production of an excess of growth with but little fruit. Wood ashes and a little farmyard manure well mixed with the soil will produce excellent results. [Try to use none but soft or rain water, and do not give too much when the plants begin to flower.—Gen. Sec.]

Port Lincoln, January 19.

Present—Messrs. W. Laidlaw (Chairman), G. Dorward, J. P. Barraud, R. Puckridge, K. S. Brown, J. O'Shanahan, and J. Anderson (Hon. Sec.).

Protection of Haystacks.—Mr. Geo Dorward read the following paper on "How to Protect Haystacks from Damage by Rain or Fire":—

The stack, when being built, should always be kept much higher in the middle than on the outside, more especially when you commence putting the head on; and when heading, the stack should be kept very full in the centre; this will, to a great extent, prevent wet getting in until the stack is thatched, which should be done as soon as possible after the heading is finished. If the stack is to be covered with thatch, then it is better to let it set down for about ten days; if thatched before settlement the string fastening between the pegs is apt to get loose and the thatch gets out of place in windy weather, and so lets the wet in. Every careful farmer will secure his haystack within a fortnight after it is built. Half an inch of rain will do more damage to the stack than the cost of covering twice over. I consider that in a stack of 50 tons, at least 2 tons would be damaged and unfit for horse feed. Nothing is more hurtful to a horse than wet musty hay. Many farmers wonder why their horses are so often troubled with colic or gripes. I think in nine cases out of ten this complaint is brought on by badly got up hay, still further damaged if left uncovered. In this district good material can so easily and cheaply be got that it is no excuse for the farmer to say he had no time or could not afford to pay a man to do the work. I estimate the cost of thatching, say a fifty-ton stack, with what is known as thatching grass, at £2 12; one man three days cutting thatch; one day carting; two days thatching; in all six days at 7s., £2 2; cost of twine, 5s.; thatch pegs, 5s.; in all, £2 12s. This cost would only be for the first year. If the thatch was taken off carefully and stacked where it could be kept dry it would last for at least seven years. The pegs also can be saved from year to year, then the cost would, by reasonable care, be reduced to the cost of the man's labor, thatching only. I have travelled over a good part of the district lately, and on many farms the haystacks are still uncovered and exposed to destruction should heavy rains come.

There are other damages besides rain. Fire is to be dreaded, and very few farmers take the trouble to provide against the danger. Care should be taken to prevent anyone smoking, with or without a cover on their pipes, near the stack yard. Stacks should not be fenced around with brushwood when posts and wire can be got for little cost, or, better still, if stone is handy have a stone wall, and outside of it a space of at least 20ft. should be cleared of grass. Care should be taken not to light fires where there is the slightest danger. A short time ago I set fire to some bushes where, as I thought, there was no possible danger, but the wind changed in the opposite direction to what I expected, and in less time than it takes me to write this, about 100 acres of valuable grass were destroyed, and only for the timely assistance of my good neighbors, my whole homestead and all I possessed would have been destroyed, while no doubt the adjoining farmers would have suffered. To insure against fire is not costly, and I think it wise of every farmer to have his haystacks and buildings covered by reasonable insurance.

Lipson, January 13.

Present—Messrs. S. F. Potter (Chairman), J. Wishart, W. F. Darling, Jas. McCallum, Geo. Carr, E. Thorpe, Jas. Brown, E. J. Barraud (Hon. Sec.), and two visitors.

Diseased Wheat.—The Chairman tabled heads of wheat affected by some disease. [Why not send some on to this office? Perhaps we might find out what it is and suggest a remedy.—Gen. Sec.]

Bags as Wheat.—A discussion took place on the action of millers and wheat-buyers in weighing bags in and paying gross weight instead of allowing for cost of bags, members being unanimous in condemning the practice. Strong complaints were also made of practice of buyers in making a deduction from price if bags have been mended, when probably the bags sold by the millers themselves are not strong enough to hold the wheat. They considered that the vendor, and not the unfortunate farmer who had to mend the bags, should suffer.

Clarendon, January 11.

Present—Messrs. J. Spencer (Chairman), R. Hilton, A. Harper, J. Wright, J. Piggott, A. A. Harper, and A. L. Morphett (Hon. Sec.).

Officers.—Mr. J. Spencer was elected Chairman, and Mr. A. L. Morphett re-elected Hon. Secretary for the ensuing year.

Bird Pests.—Several members stated that magpies had done a lot of damage to growing crops, and that the starlings were proving very destructive to fruit and corn crops, though at the same time they appear to do some good by eating insects.

Rabbits.—Members reported that the local council had declared the district a rabbit district, and given notice to all residents to destroy rabbits on their land, February 1 being appointed a day for simultaneous action throughout the district.

Ringworm on Calves, &c.—This is contagious. Mix equal parts train oil and kerosene and apply at night. Next morning clear the affected parts with a knife by scraping, and apply a mixture made of equal parts of corrosive sublimate and lard. Do not let it get into the eyes of the animal as the mixture will destroy the eyesight. Mercurial ointment rubbed in will also cure ringworm. Be careful not to use the naked hand with either of the above preparations.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— February 1, 1900.

Though several heat waves passed over this colony during January, the spells were but short-lived, so that the month's weather for midsummer was tolerable. A few showers of rain freshened up feed a bit, and in some parts helped to replenish dams and tanks, but generally speaking the weather, as usual for time of year, has been dry. Farmers are busy cleaning up and carting their wheat, so that it is impossible to get at any close estimate of the available surplus, but the average yield is pretty generally reckoned as being somewhere in the vicinity of 6bush. Pastoralists are having a fair season, and those woolgrowers who sold their clips in the colony are congratulating themselves on having done so in face of the weaker values now ruling in Europe.

Business may be described as fair; no great volume of trade passing, but average quantities in most lines being put through. The improvement on returns from copper is beginning to be felt by our miners, and a steady increase in the colony's output may safely reckoned on.

There is nothing very cheering to report about the breadstuffs market, not even a fluctuation either European or locally having occurred during January, and although the money market is now less stringent, the expected speculation revival has not shown. A fair quantity of wheat is being shipped for the United Kingdom and South Africa, but most of the latter trade in breadstuffs is being done from Melbourne and Sydney, where, much to the surprise of our local merchants, all British War Office orders in these lines are being placed. Farmers generally express confidence in the future of the wheat market, and those who are able to hold mostly decline offers to sell, although, as usual, there are many who prefer and for other reasons are prepared to quit, so that millers and shippers are not experiencing much difficulty in securing their requirements. It is stated that exporters are working without any apparent margin of profit, but no doubt they hope to benefit by any alteration in the European market whilst their cargoes are on way. The future of values must from this out become largely controlled by the weather and crop prospects during early spring in the northern hemisphere. Meanwhile those who are expecting an advance in price must content themselves to wait, as immediate prospects do not show any indications of the long-looked-for rise in value. Locally there has not been any increased demand for forage; but prices, with the exception of millers' offal, have improved in sympathy with the higher rates ruling intercolonially, caused by the heavy demand for South Africa. Bran and pollard are cheaper than when last reported, but stocks are very light in millers' hands. Feed grains are readily obtainable at quotations, but chaffcutters find difficulty in securing supplies of hay, even at advanced rates.

Favorable weather has prevailed for the potato crop, so that a good yield is expected, especially in the South-Eastern districts, where they estimate they will have 50 per cent. more to market than they had last year if nothing occurs to seriously interfere with prospects during the next few weeks. This would mean over 13,000 tons, and for practical purposes it is safe to write something off, as conditions may very much alter before digging is completed. The price has fallen, owing to the low quotations from Victoria and Tasmania, where crops are likely to be heavy Onions are being offered in excess of requirements, so that extremely low values are ruling, and as this is a product that cannot be very well kept in a climate such as this, there seems but little hope of improvement until cold weather sets in.

In dairy produce most lines have been fairly dealt in. With the opening of the new year, during an extremely hot spell, butter became scarce, prices of good quality advancing fully 6d. per pound. This, however, could not be sustained in the face of the lower rates and big surplus available in Victoria, so an easing back occurred, which, assisted by a change to cooler weather conditions, present rates may be expected to maintain. Bush fires have caused considerable injury throughout some of our best dairying districts, and this is likely, by further lessening supplies, to make us dependent upon our neighbors for at least a portion of our wants in butter till after the rains. The seasonable improvement noticed in the egg trade whilst last writing received a rude shock through a plague scare, which caused the shipping companies for a time to decline all cargo from this colony, thus entirely stopping the transport of our surplus of eggs to our chief buyer, Western Australia. The immediate effect was not only to prevent the seasonable advance, but prices were knocked back fully 2d. per dozen, and it is safe to reckon that this sum at least was lost by producers during all the month through the fear of quarantine regulations. All restrictions, however, now being removed, trade is resuming its ordinary aspect, and within the past few days a recovery of 3d. per dozen was shown. Fair business has been done in cheese, but the competition amongst sellers continues to unnecessarily depreciate prices. Good demand has existed for bacon and hams, but in the former a large proportion of the sides coming forward have been heavy, so that whilst higher rates are obtainable for handy-sized bacon the market is glutted with heavy meat, although mostly of prime quality. Hams are very saleable. Honey is a shade easier in price, though considerable business being put through; beeswax brisk of sale; almonds continue scarce, with buyers holding off for the new crop. Poultry-growers were interested to some extent in the check to trade caused by the plague scare, buyers for export suddenly ceasing to operate. Prices as a result dropped heavily, but as supplies shortened when consignors became aware of the position values came back a bit, but still are lower than ruling a month ago. Good table roosters sell from 1s. 4d to 1s. 9d.; medium cockerels to fair hens, 1s. to 1s. 3d In ducks, prime, worth 1s. 9d. to 2s., fair birds, 1s. 5d. to 1s. 8d, light and poor sorts, 1s. to 1s. 3d.; geese slow of sale, at 2s. 2d. to 2s. 9d. for ordinary birds; pigeons, 4d. to 6½d.; turkeys 4½d. to 5d. for fattening sorts; medium to prime table birds, 6½d. to 10½d. per pound, live weight.

Market Quotations of the Day.

Wheat.—New, at Port Adelaide, 2s. 7½d. to 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 5s. to £6 7s. 6d.; country, £5 12s. 6d. to £6 per ton of 2,000lbs.

Bran, 8¾d.; pollard, 9½d. to 10d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 8d. to 2s.; good white, to 2s. 10d.; New Zealand stout feed, 3s. 6d. per bushel of 40lbs.

Barley.—Malting, 2s. 9d. to 3s. 6d.; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 12s. 6d. to £3 17s. 6d. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Local, new, £3 to £3 5s; Gambiers, £2 17s. 6d. to £3 per 2,240lbs.

Onions.—£2 to £2 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. to 1s. 2½d.; dairy and collectors', 8½d. to 1s. 1d. per pound.

Cheese.—S.A. factory, best, 6d. to 6¾d.; ordinary to fair 4½d. to 5½d. per pound.

Bacon.—Factory-cured sides, 4d. to 7d.; nice farm lots, 5½d. to 6d. per pound.

Hams.—S.A. factory, scarce. 7d. to 9d. per pound.

Eggs—Loose, 9½d.; in casks, f.o.b., 11d. per dozen.

Lard.—In bladders, 4½d.; tins, 4d. per pound.

Honey.—New, 2½d. for best extracted, in 60lb. tins; beeswax, 1s. 1½d. per pound.

Almonds.—Soft shells, 5d. to 5½d.; kernels, 1s. 1½d. per pound.

Gum.—Best clear wattle, 1¾d. per pound.

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NOTES AND COMMENTS.

The *Register* in its annual estimate of the wheat harvest puts the area sown as 2,000,000 acres, of which 1,700,000 acres were reaped for grain, and calculates that this area will yield on an average 6bush. per acre. After allowing for local requirements for seed and feed, this shows a surplus of 180,000 tons available for export, as against 175,000 tons from the previous harvest. Already over 35,000 tons have been exported.

Up to within the past year or two it has generally been considered that it would not pay to use commercial fertilisers in districts where the rainfall did not exceed 13in. to 14in., but late experience has shown that even in these districts the results, especially in well-prepared soil, is distinctly profitable. There can be little doubt that on early fallow the application of a small quantity of fertiliser containing soluble phosphoric acid is decidedly beneficial if there is sufficient rainfall to bring the crop to maturity. One advantage of the fertiliser is that it brings the crop to maturity earlier, and consequently is more likely to escape injury from hot winds. It is of course admitted that when the crop is an absolute failure the additional expense for fertilisers entails a heavy loss to the farmer, though the fertiliser is not lost, but remains in the soil available for the next crop.

A gentleman who is very largely and intimately connected with the grain business suggests that the fair average sample of each season's crop of wheat should be taken by a Government official, as is done in Canada and North America, with the object of maintaining a high standard. Our system seems to be to mix all samples, good and indifferent, thus offering no inducement to good farming in respect of clean wheat, as the dirty farmer gets as much for his grain as is given to the clean farmer. So long as the sample weighs 63lbs. and is not smut-tipped, it commands the same price as a prime clean wheat of 65lbs. This simply means that the clean wheat bought at market value must be used to "doctor up" inferior lots to f.a.q. This is most undesirable from a farmer's point of view, as the thrifty, intelligent, honest farmer has to work for the lazy, dishonest one.

Weasels were introduced into New Zealand several years ago to destroy the rabbits, but, as usually happens, they have not only failed to accomplish the purpose for which they were introduced, but have in their turn become a serious nuisance. In parts of the Auckland and Waikato districts in particular their ravages amongst the poultry yards have become very severe, and it is stated that a child 11 years old was also seriously injured by weasels. The residents are now demanding the removal of the protection afforded by law to these animals when they were introduced.

Mr. Edwin Duryea, photographer, of Wallaroo, issues a timely warning against the careless use of cyanide of potassium. It is without any doubt a most deadly and dangerous poison—more so than strychnine—because it kills by its smell, by contact with sores or scratches, and by being swallowed. In the hands of persons skilled in the use of chemicals it is highly dangerous; therefore no person should use it without a full and certain knowledge of what may happen through the slightest mistake or inadvertence. Farmers and others within the settled areas should use phosphorised pollard and similar poisons which have been so successfully applied heretofore for destruction of rabbits.

What a large quantity of water is allowed annually to go to waste in our Northern agricultural areas! Would it be possible to prevent a deal of it finding its way into the nearest watercourses, whence it rapidly runs away to the sea? Would plough-furrows across the water-shed on contour lines of low gradients serve the purpose? Would not the water then soak into the ground to a good depth, and be there retained for a long time? These are questions well worthy of consideration, and there is at least a possibility that the idea can be carried into practical operation.

Humus is decomposed vegetable and animal matter in the soil, and is essential to the growth of plants. Humus absorbs and holds moisture to a greater extent than anything else. By means of humic acids in humus, the mineral matters in the soil are dissolved and made available for growing plants. Humus fixes ammonia, and prevents it being carried away by surplus water in or on the soil, but readily yields the ammonia to the roots of plants. Humus improves the mechanical condition of soil, loosening heavy clays and consolidating sandy soils, preventing excess of moisture in heavy lands and promoting the retention of moisture in the lighter soils. With enough of humus in any soil, the benefits from use of commercial fertilisers are greatly enhanced. Humus can be added to any soil by growing crops of peas, clover, or any leguminous or other plants and ploughing them under.

Some time ago Gibson's patent branding liquid, which was said to have the merit of not spoiling the hide by unsightly marks when the leather was dressed, was introduced by Mr. J. G. Ward, of New Zealand. The Queensland Stock Department tested it with both the special brand used with the liquid and with an ordinary iron brand, on a young bull. When the wounds healed the animal was killed and the hide tanned. The department has now secured the leather, and reports that this shows that the marks made by the new process are much plainer than those made by the ordinary fire brand, and penetrate right through the leather, thus disfiguring it very considerably.

The Glenormiston Butter Factory, situated near Terang, Victoria, is said to be the largest cream-separating and butter-making factory combined in Australia. At the height of the season 16,000galls. of milk is received daily for several weeks, and a single month's payments for milk run up to £7,223, and the weekly output of butter to 22½ tons. Two suppliers received over £200 for one month's supply of milk, while twenty-three received over £100. Several suppliers deliver up to 500galls. daily. The milk is separated by means of sixteen Alpha DeLaval separators of 400galls. each, and about 6,000galls. of milk are put through in an hour. All the supply is drawn from within five miles of the factory, and with a competent manager, good sound pastures, and careful attention to details, Glenormiston butter has an enviable reputation in Victoria and in England.

Bran is one of the safest and best feeds that can be used upon the farm. Mixed with meals that have a tendency to form into a compact mass in the stomach, it greatly aids digestion. Fed to young stock, it promotes growth and vigor, and it is very difficult to overfeed with it. Speaking of the value of bran, Waldo F. Brown, successful farmer in the United States, says—"I have for many years fed bran, and recommend it to others, and do not know of any other food so valuable in winter to keep the system in a right condition when stock are on dry rations. Bran is for winter feeding what grass is in summer—it regulates stomach and bowels, and enables the animal to better digest and assimilate the other food eaten."

Some investigations with regard to the proper treatment of trees when planting have been conducted at the University of Nebraska, U.S.A., and the following conclusions have been arrived at:—1. Two-year limbed trees are eminently satisfactory and desirable for ordinary planting; but, with good care, even one-year old trees may give good results and gain on older trees planted at the same time. 2. Whether it will pay to dig large, deep holes, and fill them up with surface soil, in which to plant the tree, is a question worthy of consideration; but, so far as these experiments are concerned, is as yet unanswered. 3. The more healthy roots left on a tree at planting time the better is likely to be the growth. Making a fresh clean cut at the end of the roots when planting appears to afford no advantage, provided the root is sound where cut in the nursery. Trees planted with no root-pruning now average decidedly larger than those which had their roots shortened, leaving a fresh cut. 4. Cutting back the tops severely at planting time is a mistake. Trees left entirely unpruned, or with the branches shortened about one-half, are, thus far, much in advance of those pruned to a cane or grown as a whip in the nursery. 5. Fall-planted trees may make a small amount of root-growth before winter, and in early spring before leaf-growth begins.

It has been suggested more than once that the codlin moth is attracted by an ethereal odor emanating from oil in the leaves and newly-forming fruits of apple, pear, and other trees of a similar nature, and that, by disguising or overpowering this odor with a spray of carbolic acid or other malodorous compound the moth would be unable to distinguish the proper food for its caterpillars. Whether or not the malodorous compound would injure the tree or its fruit is a matter as yet unsettled; but the idea is well worthy of experimentation. Support is lent to the contention by the fact that the moths can be deluded and trapped by an infusion of boiled apple in water placed in vessels hung up in the trees liable to be affected.

In the apple and pear orchards the most fruitful sources of infection with codlin moth are returned empty fruit cases and the stores in which empty cases and where apples and pears are kept for later marketing. When the caterpillars have reached their full development they leave the fruit and hide in the most suitable places, where they spin a cocoon and wait for the change into moths. Crevices in woodwork of any description or any other dry substance afford just the right sort of shelter for the caterpillars. If the fruit were laid upon strong straw or reeds, cut into short lengths, the caterpillar would creep into the hollow ends, and, when the fruit has been cleared out of the store, the straw and reeds could be burned, thus destroying all of the caterpillars. Both fruit stores and box or case stores should be built moth proof, with a glass window, so that all moths maturing inside may be starved before they can escape.

The *Pacific Rural Press* of December 16, 1899, says—"The British Columbians do not propose to let any national feeling stand in their way in preventing the entrance of the codlin moth. Last year the inspectors destroyed shipments of apples from California. Recently two whole carloads of Canadian apples from Ontario were dumped in the crematory, being affected by codlin moth, and 2,000dols. went up in smoke. Evidently wormy apples are not to go in the future."

In Colorado, U.S.A., a law prevails under which *all* stud sires must come up to a fixed standard before they are allowed to be used. Scrubs—crossbreds or nondescripts and mongrels—are completely barred. No inferior stallion, bull, or scrub ram may be kept without payment of a licence fee. Each dairy farmer must furnish one high-grade bull for every twenty-five cows. Violations of this law are punishable as misdemeanors. Anyone is authorised to castrate scrub sires found at large. [It is a pity that some such law does not prevail in Australia, where scrubbers are allowed to overrun the country, and nullify the efforts of progressive and enterprising farmers who wish to improve their stock, their dairy cattle, and their sheep, pigs, &c.]

It is slow work when the team is lean and hungry, and it is hard work when the axe is blunt or the plough is badly set. A few pounds only added to the draught of an implement costs a great deal by the end of a day's work, still more in a week, and may mean a difference between profit and loss at the end of the season. Study economy and efficiency together, giving preference, if any, to efficiency. Keep everything bright, clean, and sharp, and work will be easy and profits more sure.

POULTRY NOTES.

BY D. F. LAURIE.

The moulting season is in full swing, and the birds will require extra attention in many ways. Old hens take a long time changing their plumage, and, as a rule, do not lay for a considerable period, often not until spring, owing to the strain on the system. Unless under special circumstances, a hen after her third season is not worth keeping. Where birds are kept for eggs only, this rule should be strictly adopted, as it is unprofitable to keep unproductive hens, Old hens and those which have turned out poor layers should be discarded. I by no means advocate selling such birds, as I hold it the duty of all poultry-breeders to use their best endeavors to improve the average hen. During the hot weather poultry is more suitable for consumption than tough beef and mutton. Very old birds can be rendered most palatable if subjected to the right treatment. They should be allowed to simmer, not boil, in a saucepan until found to be tender; a three years old hen or cock will require two and a half to three hours' treatment. When tender, carefully remove and allow to drain, add seasoning, and bake the bird, or roast it, as if a chicken; but it is better to lay several layers of ham or bacon on it for basting. Once tried, you will not be prepared to accept low prices for old birds, nor will you ever attempt to eat tough poultry. Ducks, geese, &c., can all be rendered as tender as quite young birds by this simple process, and many prefer them to chickens.

Scrupulous attention must be paid to cleanliness; the soil of breeding pens should be forked over, and a good dust bath provided. Those who breed for exhibition will find a dust bath excellent for the plumage, in addition to ridding the birds of vermin.

We have yet a deal to do before we catch up to our New South Wales friends with the export poultry trade. Quite recently the Board of Exports, Sydney, forwarded 2,000 prime chickens and 1,400 ducklings to England and South Africa; and I expect to see a very big total for the year. Mr. Bradshaw, the expert to the board, writes me that so satisfied are shippers with their returns that they are continuing and increasing their shipments. It stands to reason that if one Australian colony can open up a profitable trade we can also; and it is nonsense to say that it will not pay. We shall certainly have to look for an outlet for our surplus eggs at no distant date. West Australia will not always take as many as she now does, as poultry-breeding is extending rapidly there. It has been proved that eggs can be landed in London and sold at a very handsome profit; moreover, we have in our Produce Export Depôt every facility for so doing. This matter is worthy of deep consideration. Our egg export to the other colonies reached £50,000 last year, and is capable of unlimited expansion.

Judging from the many letters I receive, producers, as a rule, fail to understand that the best breeds for table purposes are not always the best for laying, and certainly the laying breeds are not suitable for table-bird breeding. All-round birds, such as Wyandottes and Orpingtons and perhaps Plymouth Rocks, will yield plenty of eggs, but the flesh is not equal to the Dorking, or Indian Game crossed with Dorkings, Wyandottes, Orpingtons, and Langshans.

One commonly hears that poultry do not pay to keep. This is not a fact; but it is, doubtless, a fact that a good many have not the brains and energy to make them pay. America leads us in many directions, one of which is commercial poultry-keeping. The industry ranks very highly in importance, and it is profitable also. Few experiments are indulged in, but every endeavor is made to improve the different breeds by careful mating, selection, and feeding. To allow your birds to destroy haystacks and let them roost on the dray or over a dirty pigstye, as I have often seen, is not the way to make money. Like other stock, poultry are, to a great extent, machines which require certain conditions if a good profit is to be extracted from them.

Chickens for export should be from four to six months old, fat, and free from deformity of any sort. Ducklings should be ready for market at eight or nine weeks old; they must be well grown and quite fat, and free from pin feathers. It is important that they should be fit for market before the pin feathers start under the skin. English buyers dislike these, and, of course, pay a poor price. A week or ten days too old makes all the difference between prime ducklings and inferior, low-priced birds. We have no geese here really fit for the English market. Those breeders who have pure-bred Toulouse or Embden sell their surplus birds as stock birds. Messrs. Ebdy & Co. imported a few frozen goslings recently, some of which weighed 15lbs. Our 5lbs. and 6lbs. weight goslings would not be looked at by English buyers. There should, however, be some good turkeys for export. These must be under twelve months old, quite fat, and as heavy as possible. Until a great improvement in the breed is made we shall not see any very extensive shipments in this line. With good stud birds our farmers would find turkey-rearing a very profitable undertaking, as the young birds could run on the stubble at very little cost of feeding. So could geese; stubble-fed geese command top prices, as they are much superior to others.

DIE-BACK DISEASE OF FRUIT-TREES.

During late years numerous complaints have been made of losses resulting from some trouble, appropriately named die-back, amongst truit-trees, particularly apples and apricots. The disease attacks young trees, portions of the trees commencing to die back at the extremity of the branches, only one side being usually affected at first. If cut back to good wood in the winter, the limbs will generally throw out a number of shoots, which, however, fail with the advent of hot weather. Various causes for the trouble have been assigned, including unsuitable stocks, unsuitable and impoverished soil, and bad drainage. These two latter are undoubtedly the cause of much of the trouble with apricots. Mr. E. M. Sage, of the Pinery, states that affected apricot trees, cut sharply back and manured with superphosphate, have made healthy growth for several years, while those unmanured have died right out.

In Victoria the same trouble with apple-trees has been experienced, and Mr. J. Johnstone, of the Mount Macedon State Nursery, was deputed to make an inquiry into the matter. In his report to the Minister of Agriculture Mr. Johnstone states that, in his opinion, the disease is due to the stocks used for grafting. The Northern Spy and Winter Magetin stocks, which are almost universally used, do extremely well in most parts, but in others they are a failure, especially where autumn pruning is practised. He recommends the use of the Duchess of Oldenberg roots in preference to these two varieties, as it is a good grower, and cannot be surpassed as a blight-proof stock, while it is always good for sandy soils. Mr. Johnstone also recommends the more general adoption of finger-and-thumb method of pruning during the growing season, to avoid the necessity for cutting back to hard wood in the autumn, especially with those trees showing signs of decay.

PRODUCTION OF OLIVE OIL.

During the past few months some correspondence has taken place between the Hon. Minister of Agriculture, and the officer in charge of H.M. Naval Stores in Sydney, in regard to supply of olive oil for use of the British Fleet in Australian waters. What is required is oil of a quality suitable for lubricating purposes, for which there is a very large demand, the annual consumption by the Australian station for navy purposes being about 10,000galls. The oil needed would require to be sold at Sydney at about 3s. per gallon. Up to the present nothing lower than second-class olive oil has been produced in South Australia, and all this is fit for medicinal and food purposes, and meets with a ready sale both locally and for export. In other countries, where the output is large, and the factories produce large quantities of oil, a low grade oil for lubricating purposes is obtained, we believe, by distillation after the firsts oil has been expressed from the pulp. All our South Australian factories are too small to take up this matter individually; but it is a question whether it would not be profitable, in view of the fact that there is a certain market for the oil close at hand, for the various manufacturers to combine to erect the necessary works for the purpose. The production of olive oil in South Australia amounts to from 5,000galls. to 7,000galls. annually, all of which is readily disposed of. About 800 acres in all are planted with olives; but there has been very little increase in the area during the past few years. In view of the immense value of the olive in the other countries, it is difficult to understand why, in a climate so suitable, they have not been largely planted in this colony, especially as the local production, even in a good season, is not sufficient to meet the demands for it. Last season the olive crop was very good; but, as usually happens here, the coming season does not promise to be anything like so good.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J. Perkins, Government Viticulturist.

The grape harvest is being gathered in, and vines throughout the colony are rapidly becoming denuded of their fruit. A discussion of the 1900 yields would at the present moment be somewhat premature. Rather than avail myself of the surmises of rumor I prefer awaiting the more reliable returns of a completed vintage. In this connection it may not be out of place to point out an anomaly that prevails in the collection of returns by our Statistical Department, anomaly that it were well, in my opinion, did the Department see its way to remedying. They terminate the year, as is fitting and right, at the end of March, and all agricultural returns, excepting those from the vine, have reference to the season immediately preceding their collection; returns from the vine, however, for reasons best known to themselves, interest not the season during which they are collected, but the season immediately preceding. Thus in February, 1900, a winemaker is asked to indicate the amount of wine made by him in 1899, and thus, as the statistics can only be published six months after their collection, we have to wait eighteen months before we can have an official return of the colony's yield. In no other wine-making country does such a practice prevail, and it is difficult to see why our colony should strike out on a line of its own, without any compensating advantage for the evident inconvenience that arises therefrom. The matter might readily be remedied by collecting the statistics in vine-growing districts not in February, but in April, when the vintage of the year can readily be estimated.

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I have said that I did not just at present intend discussing the present season's returns. Nevertheless it will be evident to everybody that there is a considerable shortage in most of our districts on the previous years' yields. The October frost was of course mainly responsible for this; the continuation of the interminable drought is also making itself felt in many vineyards. After going through a practically rainless July vines could hardly have been expected to have prospered through dry spring and summer months such as we have experienced. From another aspect the general good setting of Carbernet flower bunches is a noteworthy feature of the past season. So far as I have been able to ascertain this fact is common to most of our vineyards, where frost did not come in to interfere with the ordinary course of things. The bearing of Mataro, on the other hand, has been somewhat erratic—heavily laden in some localities, and notably at the college; in others it carried but few bunches.

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It certainly is early to speak of the 1901 vintage, and yet under our climate it may well be said that due consideration of it should be taken from the moment of the removal of the 1900 crop. In earlier months I have already had occasion to draw attention to the fact that though the season that brings it to maturity has great influence on the ultimate development of the fruit, yet it is during the season immediately preceding its visible growth that it is initially conceived. However favorable conditions may prove in the 1900-01 season, if they were essentially defective in the season immediately preceding it we cannot look for heavy crops. In other words, it is on the proper development and ripening of the wood that largely depends the abundance of our next year's vintage. It cannot be denied that during the past season, in many districts, the vines have made magnificent growth. On the other hand, over the greater part of our vine area they received a serious check towards the latter end of October, and the summer that we have recently been through can hardly be described as ideal so far as conditions of growth are concerned. In our mild autumns, however, the plants continue to grow and elaborate sap long after the removal of the fruit; it follows, therefore, that if the last month of the present season and the opening month of the new season prove favorable the plants may still be able to make headway against the adverse circumstances that have recently assailed them, and lay the foundation for a good crop in 1901. It does not follow, however, that vineyards may be neglected as soon as the fruit has been removed, and that cattle and sheep may be turned in to browse on leaves and growing shoots. It cannot be too often repeated, and more particularly after a dry summer, that such a practice is essentially detrimental to the yield of the vines during the following year. I am further of opinion that a certain amount of autumn cultivation is essentially useful in a vineyard. The first rains bring up the weeds, and a scarifier or horse hoe, whilst loosening the soil trampled down by the pickers, readily destroys them, thus considerably simplifying subsequent cultivation.

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I notice in a letter to the daily press that the Chairman of the Agricultural Bureau is again pleading for the introduction of American vines to Kangaroo Island. His plea is further supported by a leader suggesting that I might give up opposition to such a scheme. It seems to me that when writers are bringing forward pet schemes of their own they might as well take the trouble to controvert reasonable arguments that have repeatedly been brought up against them. The position to me is clear enough. We are as yet free from the phylloxera. By introducing American vines into South Australia we will certainly import not only the phylloxera, but other pests that have done considerable damage in Europe; and further, should the pest be discovered here to-morrow, we should not require American vines for another ten to twenty years, during which period we should have ample time to introduce them, more particularly as they are being introduced into the neighboring colonies. Is Mr. Krichauff prepared to endanger the prosperity of our vine-growing industry for the pleasure of knowing that there exist American vines on Kangaroo Island? France is still prohibiting the planting of American vines in some of her districts, as yet free from the pest, and are we that are wholly free to risk introducing it in our midst for an idle fancy?

Recent statistics show that the French vineyard area is still on the decrease. This is due to the recent uprooting of newly-infested areas. The area in 1899 is estimated at 4,244,335 acres, as against 4,266,283 acres, or a difference of 21,948 acres, about the extent of the South Australian vineyards.

WINE AND CELLAR NOTES.

By Arthur J. Perkins, Government Viticulturist.

Thus far the season has been fairly favorable to good fermentations; the barometric depressions that have recently passed over us can have had but little deteriorating influence on the first musts of low density. It is to be hoped that throughout the incoming month the weather may prove fine and cool. Let it be remembered that the nature of the wine to be made should be determined from the outset, and not left to chance: sweet wines should be made from musts specially prepared for the purpose, and not from badly-fermented dry wines that fail to ferment out. Temperatures should be controlled as much as possible, and not allowed to run above 90° F. Those who would learn and gain experience from the year's work must remember that vintage comes but once a year, and man can see but a limited number of vintages; it behoves everybody therefore to take careful notes in every point of interest that may arise, including a careful record of temperatures, densities, weather conditions, etc.

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French statistics concerning their last vintage have recently been given to the public. In spite of a reduced area it was considerably in excess of that immediately preceding it. The 1899 vintage attained to 1,053,968,960galls., as against 710,211,898galls. in 1898, representing 317,054,826galls. in excess of the average yield during the ten preceding years. This represents an average yield per acre of 246galls.

In addition to the above, 2,377,430galls. of wine was made from raisins; and further, the manufacture of 40,839,040galls. of sugar wine and 38,808,000galls. of "pigmettes" or small wine washed out from the skins. The imports of wines for the first ten months of 1899 amount to 154,814,000galls., and the exports for the same period to 30,954,000galls. The imports, in order of merit, come from Algeria, Spain, Tunis, Italy, and Portugal. It is a noteworthy fact that whilst imports show a slight increase on past year's transactions, exports show a decided decrease.

Simultaneously with the above are given the cider returns. The 1899 cider yield in France amounts to 458,382,496galls., which is about twice as much as was obtained in 1898.

ORCHARD NOTES FOR MARCH.

By George Quinn, Horticultural Instructor.

The harvesting of late-keeping varieties of apples and pears will be in hand towards the end of the month. In many orchards not much trouble will arise from lack of storage room, as the crops are limited.

With the exception of the South-Eastern orchards, the season's crop is much below average, both in quantity and quality, but in the above-named locality the crops are abundant and the sample unsurpassed.

Unfortunately space for shipping cannot be procured, or several thousands of cases of the very finest grade could be sent from the Coonawarra district alone.

Owing to the prevalence of "black spot" in most districts, intercolonial dealers should not fail to take advantage of the clean character of the apples grown this season in the orchards of the South-East.

Without wishing to cavil at the doings of our growers, one is well within the mark in stating that the provision for storing the winter apples and pears made by many of them is strikingly inadequate. Orchards kept in a matchless state of cleanliness are often accompanied by storehouses which are most eminently adapted for the propagation of diseases and pests which have to be fought at great cost in the orchard itself.

The most successful growers harvest these fruits with the utmost care, knowing that in their fresh state when plucked from the tree the outer skins are exceedingly crisp and brittle, being broken by the slightest contact with a hard surface. Once the skin is broken at this stage, germs of mould find an entry and decomposition sets in. If the fruits are taken into the storehouse, direct, plenty of ventilation should be allowed, and a gentle draught of dry air is not undesirable during the first few days to carry off the excess of moisture from the skins. When once the skins are toughened, and only the perfectly sound fruits stored, it is not necessary to admit anything beyond the cool evening air if hot weather prevails. These fruits should be kept dark, and if the rapid ripening of pears is desired they should be exposed to light, but not in the open air, or anything in the shape of direct sunshine.

Some of our most successful owners of storerooms pile the apples up in long rows, sloping from 30in. deep at the wall down to 6in. at the front. In the centre of these piles the fruits usually retain their crispness over the longest period. This is probably due to the less rapid evaporation from their skins on account of but slight contact with dry air taking place.

Pears will not stand such pressure, and the greatest success has been achieved by storing them in a single layer, or very hard kinds may, at the earlier stages of the storing, be laid deeper. If the sample be mixed and the weather cool it is advisable to go over the trees several times, gathering each time the largest specimens. This permits smaller fruits developing into a marketable size.

Where codlin moth abounds the storeroom should be made sufficiently close to prevent the escape of the moths when they hatch from the stagings.

The packing of apples for export is so well known now that very little remains to be said.

Should soaking rains fail to come, citrus and loquat trees should be well supplied with water. The flower spikes of the latter are much improved by this practice.

Citrus trees could be cleaned of dead wood and sprayed for the destruction of scale insects, where such are injurious. Young citrus trees could be transplanted now, but I fail to see much gain in doing it now, as a sudden fall of temperature will often damage them severely.

Budding may yet be performed, but no attempt to force growth from the buds should be made. Ties should be attended to upon trees recently budded, as much of the success depends on the care given to these at the early stage.

The bandages upon apple, pear, and quince trees should be kept there for several weeks after the fruits are harvested so as to entrap stray larvæ of the codlin moth. Weekly examinations of these bands should be made while any fruits remain upon the trees. All fallen infested fruits should be gathered frequently and destroyed or disinfected. Props and other substances which have been under or near infested trees should be burnt or disinfected also.

Excepting where irrigating is carried on cultural operations are practically at a standstill.

New ground or holes for tree-planting should be roughly broken and thrown open respectively where time permits.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following additional results of analyses of samples of fertilisers taken by myself have been received since publication of previous issue:—

Miscellaneous Fertilisers.

Vendor.	Brand.	Analyses by Official Analyst.
Norman & Co.	Reliance Super. (Nickels and Co.)	37·11 per cent. water soluble phosphate
Do.	Reliance Super. (Packard's)	38·6 per cent. water soluble phosphate
Australasian Implement Company	Lawes' Super.	38·2 per cent. water soluble phosphate
Elder, Smith, & Co.......	Lawes' Super.	*38·18 per cent. water soluble phosphate
Clutterbuck Bros.	Special Super.	39·1 per cent. water soluble phosphate
S.A. Farmers' Co-operative Union	Globe Super. (Langdale's)	38·6 per cent. water soluble phosphate
Adelaide Chemical Works	American Super.	*33·9 per cent. water soluble phosphate; 4·0 per cent. citrate soluble phosphate
A. W. Sandford & Co. ..	Kangaroo Brand Guano	*49·35 per cent. acid soluble phosphate
F. H. Snow	Star Brand Thomas Phosphate	18·1 per cent. phosphoric acid
Elder, Smith, & Co.	Bilston Basic Slag (Thomas Phosphate)	19·75 per cent. phosphoric acid
Charlick Bros.	Super.	10·42 per cent. water soluble phosphate; 20·68 per cent. citrate soluble phosphate; 16·48 per cent. acid soluble phosphate; 0·1 per cent nitrogen
A. R. B. Lucas & Co.....	Bally Bonedust, No. 3	*3·74 per cent. nitrogen; 51·84 per cent. acid soluble phosphate
Do.	do. No. 4	*3·59 per cent. nitrogen; 52·96 per cent. acid soluble phosphate
Do.	do. No. 5	2·8 per cent. nitrogen; 39·9 per cent. acid soluble phosphate

* Mean of analyses of two or more shipments.

As stated in previous issue, the percentage of citrate soluble phosphate is shown in the American super. because it is included in the guarantee, whereas, although present to a greater or lesser extent in all the brands of English super. imported into this colony, it is not included in the guarantee of the vendors, which is usually 36 per cent. to 38 per cent. water soluble phosphate. The importations of fertilisers this year consist principally of mineral super., and amount to date to over 12,000 tons, of which quite 11,000 tons are super., large shipments of which are in addition on the water, and expected to arrive during the next two months. In view of the strong demand existing for this line it is important that intending purchasers should place their orders early; otherwise when seeding time arrives they may find the market bare, and have to make use of a fertiliser not so well suited to their soils.

NOTES ON VEGETABLE-GROWING FOR MARCH.

By George Quinn, Horticultural Instructor.

The season has thus far proved fairly favorable to the development of young seedling cabbage, cauliflower, &c., in the seed beds, and good plants are now obtainable for transplanting. Excepting where a good supply of water for irrigating is available it is scarcely advisable to set out these plants yet.

Usually the greatest drawback to the production of early crops of the members of the cabbage family—and more especially when the autumn is dry and prolonged—arises from the presence of either the cabbage aphis (blight) or the cabbage caterpillar. The former sucks out the juices and causes the foliage to languish, while the latter eats away patches of the green epidermis and causes holes to occur over a large area of the leaf surface.

If the young plants are dipped bodily in a strong kerosene soap solution prior to being set out these troubles can often be largely obviated, because usually the start of these pests takes place in the seed beds, though at the time of transplanting their presence is often overlooked. If the ground is not soaked by rain it should be "furrow" watered prior to being broken up, and the young plants should be again soaked at transplanting. If manure be procurable a thin surface mulch will assist greatly in giving the young plants a chance to regain lost vitality.

The main sowings of vegetables will be made now. Peas, broad beans, cresses, radishes, carrots, parsnips, turnips of all kinds, spinach, parsley, beets, etc., will now be sown in drills, and lightly covered with loose soil, or, better still, loose broken manure.

In seed beds cabbages, cauliflowers, broccoli, onions, lettuce, kohlrabi will be sown. Celery will be planted in trenches and stimulated by plenty of water. Every small gardener should grow celery. Make a trench 18in. deep and same width. Fork up the bottom, and put in good fat decomposed manure. Cover with several inches of loose rich soil, and set out the young plants. As they grow apply water and liquid manure, and earth up the leaves, first folding them together in their natural positions to shut out soil.

When crops of young early vegetables begin to peep through the soil other succulent green growths are usually absent from the surrounding fields; consequently the sparrows make descents upon them. Cotton—black for preference—stretched along the drills just above the soil is a good deterrent until the plants harden; this is valuable for protecting peas. Preference should be given to drilling in most garden crops, because shortly there will be a heavy growth of weeds; the destruction of these and the cultivation of the soil are facilitated when the grower can feel assured of the whereabouts of the small plants he wishes to protect. If the growth of weeds has got ahead of the operations a line stretched along the row is a good guide for the workman.

Summer vegetables will still be yielding returns, and cucumbers, trombones, and marrows should have plenty of moisture. If tomatoes are staked off the soil much late fruit may be saved from rotting.

Save seeds of the summer vegetables, remembering always what has bloomed at the same time near the selected plants. If this is not observed carefully crosses may arise and disappointment follow next year. If growing a good strain it is wise early in the season to tie a piece of string or cloth around the stalk of the identical melon or cucumber which has set before any inferior kind or sort likely to be crossed has bloomed. If this be observed watermelon and pie-melon may be grown with their runners entwined and no evil results follow the sowing of the seeds next season.

All beds not in immediate use should be broken roughly and allowed to remain in that condition to aerate and collect moisture.

If rain holds off the plants of all kinds will be greatly benefited if water can be applied overhead by some of the many kinds of sprinklers now readily obtainable.

PIG-FEEDING.

Mr. J. H. Grisdale, agriculturist at the Central Experimental Farm, Ottawa, draws the following conclusions from the results of eight years' experiments there on pig-feeding:—

1. It will not pay to cook feed for swine where economy of pork production is the sole consideration.
2. There is a gradual increase in the quantity of feed consumed for every pound of gain in live weight after the average live weight exceeds 100lbs.
3. The most economical time to slaughter swine is when they weigh from 175lbs. to 200lbs.
4. The greatest and most economical gains are made when the swine are able to eat the most feed in proportion to their weight.
5. Frozen wheat may be used as a profitable feed for swine.
6. Skim milk adds most materially to the value of the grain ration, and 100lbs. mixed grains equal about 700lbs. skim milk. The relative value of skim milk in any ration varies with the amount fed, the poorest return per pound fed being obtained when the proportion of skim milk to the total food is the greatest.
7. The average dressed weight of swine is about 76·44 per cent. of the fasted weight.
8. Skim milk is a most valuable adjunct to the grain ration, when hard flesh is desired.
9. Type of animals fed influences character of meat more than breed; *i.e.*, the fact of an animal being a Yorkshire or a Tamworth will not ensure a good bacon carcase, but they must also be of a rangy type, and fed in a certain way.
10. Feeding mixed meal (barley, peas, and oats) with milk usually ensures firm meat.
11. The greatest gains from a given amount of grain appear to be made when it is ground and soaked for twenty-fours hours. Part of grain fed whole is frequently voided before being digested.
12. Mixed grains are more economical than grains fed pure.
13. Pigs whose rations are limited make, on the whole, more economical gains than pigs that are rushed.
14. Maturity or ripeness of the animal affects the quality of the flesh.

GORSE AS SHEEP FEED.

By C. J. Valentine, Chief Inspector of Stock.

Growing gorse for feeding sheep is attracting much attention in New Zealand, and quite a number of people are trying it. As it grows on poor lands, and thrives well in this country, it would be worth while some of our farmers trying it, judging from the accounts published in the Agricultural Report of New Zealand. There are plenty of places on which gorse will grow strongly on which but few sheep could be kept at present, but if by cultivating gorse the carrying capabilites can be raised to six or more sheep to the acre it should pay, and that is what is wanted. In the New Zealand report, Inspector

Fleming, in the northern district, gives a short account of its progress, and refers to the important fact that it is being prepared for winter feeding by crushing. This promises to overcome a difficulty in connection with feeding sheep on gorse, for gorse, as all other plants, grows less in winter than at any other season. Something then is wanted to supplement it, or to make the shoots that have become hardened during its dormant season available for sheep food.

In the Bay of Islands, the property of Mr. T. C. Williams, the pioneer of gorse as a pasture plant, and one who has invested largely in lands that up to the time of his purchase and cultivation in gorse had been looked upon as useless, lands that are now carrying up to and over six sheep to the acre, a capacity unapproached by any English grass paddocks in this district. Here, as well as in the Papatoetoe district, near Auckland, the land is cultivated as for a turnip crop, the Gorse drilled in at 6ft. in the rows. Crushed bones, at the rate of about ½cwt. per acre, have been used, and with advantage. This dressing, although small, is fairly efficacious in bringing the young plants on quickly. The experimental plot at Papatoetoe, Mr. Wm. McLaughlin's, is two acres; it was sown in gorse in 1896, then stocked with twelve sheep from March, 1897, to March, 1898, and from that time to the corresponding month in 1899 it never had less than twenty sheep, and for a short time in summer twenty-five sheep depasturing on it. Mr. McLaughlin is naturally so impressed with the value of gorse pasture that he has bought a large property, and in the coming spring some 250 acres will be sown with gorse. Others are becoming alive to this important development. Gorse grows well over our poorer class of lands, lands where, after the most lavish expenditure, exotic grasses fail. In some parts this plant is extensively grown for food for sheep. Mr. Williams, of Paharaka, has from four to six sheep per acre depasturing on gorse lands. As a provision for winter feed (here it would be summer feed), a large paddock has this year been sown broadcast in gorse, which will be cut and put through either rollers or a chaffcutter, and will be fed to the sheep. The system adopted by Mr. Williams is to feed off a paddock for four years, then, after a spell, put a fire through it and thus renew the gorse. By being sown in drills, sheep can more effectively keep it in check, and also derive more benefit from it.

FERTILISER LAW OF NEW YORK.

Practically all of the American states have enacted laws dealing with the fertiliser trade. Last year the New York state laws were amended to make them meet the proved requirements of the trade. The principal clauses in the Act are as follow:—Every manufacturer, importer, or dealer must pay an annual licence fee of 20dols. for each separate brand of fertiliser sold by him, and must, in December of each year, deposit with the authorities a certified copy of the guaranteed constituents of such fertilisers. Every package containing a fertiliser must have stamped on or affixed to it a plainly printed statement of net weight of the fertiliser, the name, brand, or trade mark, the name of the manufacturer, and the fertilising constituents of the manure. All fertilisers selling for 5dols. or more per ton come under the law. No person shall offer for sale any fertiliser containing leather or its products, or other inert nitrogenous material, unless a printed statement of the fact is affixed to every package. The penalty for violation of any of the provisions of this Act is 100dols. The Act provides that it shall be a violation of its provisions if any fertiliser is found to be deficient to the extent of more than one-third of 1 per cent. (0·33 per cent.) of nitrogen, one-half of 1 per cent. (0·5 per cent.) of phosphoric acid (or 1 per cent. in undissolved bone), or one-half of 1 per cent. (0·5 per cent.) of potash less than is certified to by the vendor when registering the fertiliser. In 1899 190 manufacturers licensed 2,268 brands. At, say, £4 per brand for registration, this represents revenue to the extent of £9,072, and the State can, naturally, afford to take every precaution to prevent fraudulent practices. During the spring the collecting agents of the state obtained 866 samples from 114 different manufacturers, and the analysis of these are published in a special bulletin which is sent free to any farmer applying for same. In this bulletin special attention is called to samples found to be below the guarantee in any constituent, so that the farmer has only himself to blame if he purchases from firms who do not appear capable of fulfilling their contracts.

WHEAT MANURING EXPERIMENTS IN VICTORIA.

The Victorian Government Agricultural Chemist, Mr. A. N. Pearson, furnishes the following table of experiments carried out in the North-Western wheat-growing districts, which will prove of special interest as representing the average of result of manuring under both favorable and unfavorable conditions. It is sometimes argued against the value of manure experiments that the conditions of the experiment are specially favorable to the action of the manure. This cannot be said in regard to the experiments recorded in the table. None of the fields were very early sown; two were sown moderately early, and three were very late; one suffered from flooding, and two suffered from prolonged and almost unprecedented drought; the balance of the conditions being very much on the unfavorable side.

Table of Results.

No.	St. Arnaud District.					Average of Five Stations.	Natural Yield Without Manure.	Gain Due to Manure.
	Early Sown.		Late Sown.					
	Mount Pleasant. Mr. Telford. Sown 21/4/99. Fallow.	Gooroc. Mr. Scott. Sown 28/4/99. Fallow.	Berimal. Mr. Mackay. Sown *19/6/99. Very patchy	Corack E. Mr LeLievre. Sown †end of June. Old Paddock.	Jeparit. Mr Witney. Sown ‡end of June. Fallow.			
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1	16·46	14·97	7·42	4·07	7·90	10·14	7·92	2·32
2	§12·51	13·38	6·08	3·79	3·84	7·92	—	—
3	18·22	16·56	9·43	5·17	13·60	12·60	7·90	4·70
4	18·22	16·42	11·35	5·17	14·93	13·22	7·80	5·33
5	§11·63	13·24	6·95	3·86	3·84	7·88	—	—
6	15·58	15·43	8·34	4·55	7·03	10·19	7·92	2·27
7 ..	13·84	15·23	6·18	3·66	6·59	9·10	7·97	1·13
8	§12·73	16·56	3·36	3·38	4·06	8·02	—	—
9	13·84	18·80	3·48	4·55	7·90	9·71	8·02	1·69
10	13·39	16·56	4·64	5·28	7·68	9·51	8·01	1·50
11	§12·08	15·09	4·75	4·38	3·73	8·01	—	—
12	14·27	16·56	7·65	5·51	9·00	10·60	8·12	2·48
13	13·84	16·29	8·23	5·34	9·66	10·67	8·24	2·43
14	§11·19	16·03	7·07	3·58	3·95	8·36	—	—
15	14·27	17·88	6·95	2·89	4·83	9·36	8·36	1·00

* Heavy rain day after sowing. Land flooded; under water for days; most of the seed killed.
† During four months after sowing only 0·77in rain. Wheat only 3in. high four months after sowing.
‡ Drought. § No manure.

The average of the five stations shows great regularity, the irregularities of the different individuals almost neutralising one another in the averages.

The averages of the unmanured plots are 7·92, 7·88, 8·02, 8·01, and 8·36 bushels, the extreme difference being less than half a bushel.

The average effect of the manure is shown in the last column of the table, and may be concisely presented as follows:—

	Caused an Average Increase of Bushels.
Plot 1.—10lbs. concentrated superphosphate per acre	2·32
Plot 3.—20lbs. concentrated superphosphate per acre	4·70
Plot 4.—30lbs. concentrated superphosphate per acre	5·33
Plot 6.—26lbs ordinary superphosphate (the same amount of phosphoric acid as in plot 1) per acre	2·27
Plot 7.—26lbs. Thomas phosphate (containing the same amount of phosphoric acid as in plot 1) per acre	1·13
Plot 9.—10lbs. concentrated superphosphate and 20lbs. nitrate of soda per acre	1·69
Plot 10.—10lbs. concentrated superphosphate and 40lbs nitrate of soda per acre	1·50
Plot 12.—15lbs concentrated superphosphate and 60lbs. nitrate of soda per acre	2·48
Plot 13.—15lbs. concentrated superphosphate and 46lbs sulphate of ammonia per acre	2·43
Plot 15.—15lbs. Thomas phosphate and 60lbs. nitrate of soda per acre	1·00

The great regularity of these results is evident. Thus, on plot 1, 10lbs. concentrated superphosphate caused a growth of 2·32bush ; 20lbs. should therefore have caused 4·64bush.; on plot 3 the actual amount obtained experimentally was 4·70bush. The heaviest dressing, namely 30lbs., was too heavy to come into full action; in three out of the four cases it produced no more than the medium dressing, but at Jeparit it had a very fair additional effect, amounting to 1·38bush. above the medium dressing; and at Berimal the heavy dressing was proportionately as effective as the light dressing, thus—

	Superphosphate. Lbs.	Produced Bushels.	Each 10lbs. Producing Bushels.
Plot 1.—Light dressing	10	1·34	1·34
Plot 3.—Medium do.	20	3·06	1·72
Plot 4.—Heavy do.	30	4·69	1·63

Each 10lbs. on the average produced in this case 1·60bush. The Mount Pleasant and Jeparit results show that, under more favorable conditions, each 10lbs. could produce more than twice that amount.

Farmers have been afraid of using concentrated superphosphate because of its high price, £12 10s. per ton, and have not realised that it is a very cheap manure. It is the phosphoric acid in the manure that one has to buy, and all other matter mixed with the phosphoric acid, as a rule, simply adds to the cost of carriage. There were a little over 4½lbs. per acre of phosphoric acid, given in the form of concentrated superphosphate, at a cost, reckoned at Melbourne prices, of 1s. 1¼d. per acre, to plot 1, and the result was a gain of 2·32bush. of wheat per acre On plot 6 there was the same amount of phosphoric acid given as ordinary superphosphate, at a cost of 1s. 2d. per acre, and the result was practically the same. namely 2·27bush., the final result being about 2d. per acre in favor of the concentrated.

On plot 7 the same amount of phosphoric acid, at a cost of 1s. 2d. per acre, was given in the form of Thomas phosphate, and the result was a little less than half that obtained from the superphosphate. This agrees closely with English and European experience.

Plots 9, 10, 12, 13, and 15 show the effect of mixing nitrogen with the phosphoric acid manure. Plot 9 received 10lbs. concentrated superphosphate, the same as plot 1, but in addition received 20lbs. nitrate of soda, and the result was a decided decrease in the effect of the phosphoric acid—1·69bush. instead of 2·32bush. Plot 10 received twice as much nitrate of soda, with the result that there was a still further decrease in the action of the phosphoric acid. Plot 12 received one and a half times the amount of phosphoric acid that plots 9 and 10 received, and one and a half times the amount of nitrogen that plot 10 received; and the result is about one and a half times as great as plot 9, namely 2·48bush., one and a half times being 2·52bush.

On plot 13 the same amount of nitrogen was given as on plot 12, but it was in the form of sulphate of ammonia instead of nitrate of soda. The result, however, was practically the same, namely, 2·43bush., as compared with 2·48bush.

Plot 15 had the same amount of phosphoric acid and nitrogen as plot 12, but the phosphoric acid was given as Thomas phosphate, and the result is similar to that already referred to on plot 7. The result is somewhat less than it should be, apparently owing to an unexplained low yield at the plot in Corack East. If the Corack East plot be omitted, we get the following results:—

	Bushels Wheat.
Plot 12.—7lbs. phosphoric acid as concentrated superphosphate, and 9½lbs. nitrogen as nitrate of soda	2·75
Plot 13.—7lbs. phosphoric acid as concentrated superphosphate, and 9½lbs. nitrogen as sulphate of ammonia	2·66
Plot 15.—7lbs. phosphoric acid as Thomas phosphate, and 9½lbs. nitrogen as nitrate of soda	1·42

And in this case the proportion is almost exactly the same as between plots 6 and 7.

SEED WHEATS.

By T. A. Wilson, Port Pirie Branch.

Paper read at Bureau Conference at Port Broughton, in April, 1899.

There is room for improvement in the treatment of seed wheats, and I think our Branches have, in the bringing about of a better system, a work they should willingly undertake.

There should be a check upon the indiscriminate and endless production of new varieties. Such a large increase of sorts (or names) during the last few seasons is as absurd as it is uncalled for. The only good point about it is that it shows an increase of observation and interest, but too often employed without knowledge, for a number of so-called new sorts are only old ones masquerading under new names, which shows the necessity for the existence of a local authority on the subject to which all new local wheats should be submitted for approval or otherwise; and what so well fitted for such a work as our several Branches, comprised as they are of practical progressive farmers, a body of men that, in each district where Branches are established, have sufficient influence to establish a test or standard to which all wheats should come before they would be admitted as new or worthy a place in the list of approved and tried wheats to grow in that district. Let there be a practical outcome of all the late discussion on "Best Wheats for District," &c., and also accurate information about other wheats in other districts. The test should be in regard to wheats put on the list. They must possess special characteristics differing from other previous known sorts, which said favorable characteristics they must have retained and propagated without deterioration for at least six (6) years. When accepted add all the information obtainable about them, as name, name of originator, where originated, selected or hybridised, how long in district, suitable for what class of soil, early or late, milling qualities, rust-proof or not, where seed (good and clean) can be obtained, and at what price, so that a stranger buying a farm can at once get from the Branch all necessary and thoroughly reliable information about what wheats to sow, &c.

The status and influence of any Branch should be such that if any person thought to originate a new variety it would be their ambition to get it on to the Bureau list, and, failing that, it should be given up or sown at buyer's own risk. The Branch could also tell anyone asking if a new sort gave any promise of being different, so that it would be necessary for each Branch to possess all the lists compiled by other Branches, with samples ingrain and ear.

Farmers also require to exercise more care in selecting their seed wheat in order to get the best results. The same principle applies here as applies to the breeding of stock—wheat should be graded and only the best grains sown; done by machinery or hand-picking while in the ear. If this is not done, the wheat will deteriorate. Getting a change from other districts or colonies is beneficial, yet selection or grading should not be neglected. Too many farmers (?) pay no attention to this point; but as in stock they breed from any animal travelling round (led or loose) without regard to soundness or pedigree, so in seed wheat, "it is all right so long as it is wheat"—the presence of drake, barley, or oats not mattering. If we advocate the possession of a veterinary's certificate by stallion owners for their horse, we should on same ground advocate pedigree wheats.

Though we may aim at checking the increase of new varieties, yet, on the other hand, due encouragement should be given to persons to produce new sorts superior to any yet known; especially should we encourage those gentlemen who have the ability and the leisure to cross-fertilise or hybridise, for they may succeed in producing a sort we want, viz., an early, good milling, rust-proof wheat. There is more hope for us in this direction than through mere selection, for a new selected wheat improperly tested may be good or superior one year and a degenerate failure the next, as I have seen. This would not occur with a hybridised wheat that had retained its special superior characteristic for six years.

I think we are making a mistake in neglecting the rust-proof varieties simply because of immunity from red rust for a few years; given the wet season we hope for, we may wish we had sown these sorts also.

GOATS FROM AN ECONOMIC POINT OF VIEW.

[From Annual Report Farmers' Institutes, Ontario.]

To such an extent has the goat come to be looked upon as merely a theme for humorous writers in the slack season of the dog days that we are apt to forget that apart from its propensities for butting, and devouring what seem hopelessly indigestible articles, it possesses, when viewed from an economic standpoint, characteristics which should commend it to the attention of those whose lot is cast in rocky districts such as are found in Muskoka, Algoma, and also, in a limited degree, to those who live in the outskirts or within a reasonable distance of large cities. As regards the former, the advantage will be found in the fact that the goats will pick up a living where cows would starve, and will, in addition, give enough milk for the family; while those owning goats near cities will derive a considerable revenue through supplying milk to invalids and children, for which purpose goats' milk is pre-eminently suitable, being more easily digested than that of cows on account of the smaller size of the fat globules.

Advantages of Goat Keeping.—The ability of the goat to live where a cow would simply starve, and the small comparative cost of purchasing one, furnish strong reasons why many who desire to have a supply of new milk of good quality available at their door should invest in a goat for that purpose. Goats, of course, do best if they have a pasture to roam over, but many cottagers in Great Britain keep goats who have no other means of feeding them except the limited growth of grass in parts of their gardens, with perhaps an occasional tethering on the roadside, and the refuse from their garden stuff. The milk of a couple of good goats will generally supply a fair sized household, while with three there will be an ample supply all through the year.

The goat has one important point of advantage over its rival, the cow. It is almost entirely free from tuberculosis, and consequently there need be very little fear that the seeds of consumption could ever be conveyed to human beings who drink goats' milk. Moreover, their milk is more nutritious, and is oftentimes recommended by doctors for use by sickly and delicate children and invalids. In Great Britain as high as 1s 6d. and 2s. a quart is paid for goats' milk for sick or weakly persons.

Stabling for Goats.—While a goat can spend most of its time out of doors during fine weather, it, like other animals, must have a place of shelter to which it can resort during storms, and in which it can pass the winter. Here again it has another advantage over the cow, inasmuch as a much smaller and cheaper building is required. If there is no shed available and one has to be built, it need be no bigger than 5ft. square for a single animal. Two goats can be very comfortably accommodated in a shed 6ft. x 8ft. When more than one goat is kept it is best to give each one its own stall. No bedding is required, provided a movable slatted shelf is laid on the flooring of the stall. There should be a rack for the hay and a small manger for the grain and other feed, or what is better a receptacle for a pail, so that the latter can be removed and cleaned out. For tieing purposes a wide dog collar and short chain or a leather halter with a chain are generally used. The chain should be short enough to prevent the goats turning round in their stalls and soiling their food, because they will always refuse to eat any food that is dirty.

Food for Goats.—In summer goats will do best on pasture, but if they are allowed to roam at will in a field care must be taken to have good fences, as they will otherwise jump over them. A 4ft. woven wire fence is sufficient to restrain them, however; but when the goats are "breachy" it is a good plan to tether them and move them twice a day. Goats dislike rain and wind, and they should, therefore, be brought in during a rain storm if it is severe. If "soiling" is practised on account of want of pasture they will do well on cut grass or leaves, the refuse of vegetables, potato and apple peelings, and any crusts of bread, provided always that these are kept sweet and clean. Fresh water should be given twice a day at least.

During the winter small quantities of hay will have to be given at each meal, together with roots and linseed cake, while the goats in milk should also get ½pt. of oats at a meal. Goats are rather capricious in their appetites, and some will eat greedily what others will not touch. The owner will, therefore, have to study the inclinations of his goats, and feed each according to its fancy. Three important rules must, however, be observed—to feed often and give as great a variety as possible, and to see that the food is perfectly clean. Some feed their goats four times a day, but most not more frequently than thrice. When turnips are fed, goats seem to prefer them cut in half but not sliced. They then scoop out the fleshy part and leave the skin like a shell. • When once a goat has become used to corn it prefers it to oats or any other grain, and it seems to like it in the whole state better than when crushed or soaked. Mr. Holmes-Pegler, the secretary of the British Goat Society, prefers corn to oats for his milking stock. The grain is fed by itself and not mixed with cut feed. Goats are very fond of rock salt.

Breeds of Goats —It is only during the last twenty-five years that any steps have been taken in Europe to improve and classify the various breeds of goats. The first British show of goats was held in 1875. The British Goat Society, organised in 1879, now has a herd book which contains over 700 entries. The goats found in Great Britain are a mixed breed, made up by crossing native goats with Nubian, Toggenburger, and other breeds. The Nubians are distinguishable by their drooping ears, and being good milkers have been used freely on the native British goat, and many of the best goats in that country are now largely of Nubian blood. The Toggenburg breed comes from Switzerland, where milk production in goats is sought for as much as possible. They are of a mouse color, harmless, have erect ears, and a light band down each side of the face and on the lower parts of the legs. Crosses of this breed have figured largely at goat shows in England. Both Nubians and Toggenburgers are short haired goats Then there are Welsh or rather Irish goats, which are rough haired and horned and are almost worthless for milk production. From Malta comes the white Maltese goats, some of which are extraordinary milkers. In Germany five goats are kept to every hundred of the population, and they are also largely kept in Italy and Greece, in the mountainous regions where no other live stock would thrive.

In Syria and parts of France the dairymen drive their goats round to their customers' houses and milk them before their doors, the customer, if he has any preference, designating which goat he wishes milked.

There has never been any standard of points drawn up for the British goat, inasmuch as a great variety of types in color, size, and as regards horns, is always to be found, the practice has been followed at exhibitions of ignoring purity of breed, the prizes being offered with a view to encourage the selection of the best milkers, irrespective of breed. In a general way the points aimed at are size; a fine smooth coat of short glossy-hair; horns, if any, to be small as possible, dark in color, and to curve backwards; the females to be of the same distinguishing types as cows of a dairy herd, viz., wedge-shaped, and carrying large and shapely udders and teats, the udders to be soft and elastic and not fleshy, the teats to be nicely tapered, set far apart, to be from 2¼in. to 3¾in. long.

Angora Goats.—Angora goats are now raised in considerable numbers in various states of the Union, the original stock having come from Asia Minor and Turkey. In some parts they have thrived exceedingly well, and as their hair, which is known in commerce as mohair, sells for three or four times the price of common wool, the raising of these goats has been quite profitable. Increased attention is being given to them in California and some of the other western states. In addition to the profit derived from their fleeces they have been found invaluable in clearing land covered with small scrub and brushes, goats having a great fancy for eating small limbs and twigs of trees. It is claimed for them that they can stand cold weather well, but it is at least doubtful whether they could be raised profitably as far north as Canada, or whether they could stand the winter successfully. In Minnesota a breeder states that he has made money raising them, and that the females breed on an average two kids a year each. For those in search of milk production, however, a goat with Nubian or Toggenburger blood in its veins would be the most desirable.

Goats' Milk.—For household purposes goats' milk surpasses cows' milk, being richer, sweeter, and more nutritious. When used for pastry its richness enables the housewife to reduce the quantity of eggs that would be otherwise used, while the easiness with which it is digested is another great recommendation. The average percentage of water in goats' milk is 83·21; of butter fat, 7·30; and of other solids, 9·49; while in cows' milk the average figures are water, 87·56; butter fat, 3·63; and other solids, 8·81 per cent. Goats' milk more closely resembles human milk than cows' milk. If properly cared for no difference of flavor can be detected between it and cows' milk. It is not satisfactory for butter, but does well for cheese-making, the world-wide known Roquefort cheese and other makes being composed largely of milk from goats. Goats can be milked from the side or from behind. As a general rule they are milked only twice a day. They are in their prime from about three to six years old. Good milkers will yield from 3pts. to 4pts. a day, although this limit is often exceeded by individuals, and as much as 3qts. a day has been obtained from exceptional milkers. Goats vary, however, very much in their milk yield, and the only satisfactory method when purchasing a goat is for the buyer to see the animal milked. A convenient way when goats are milked is to make them stand on an elevated platform or bench. The operation is not so hard on the back when this is done.

In Germany experiments were conducted with sixteen Swiss goats which were milked thrice a day. The milk yield for the year ran from 421·91 to 911 litres,* with an average of 678·41 litres. The fat content of three to four year old goats averaged 3·6 per cent., and of younger animals, 2·79 per cent. for the entire period of lactation. When native goats were tested the milk yield was from 674·72 to 1,255·44 litres during the year, the average being 877·88 litres. The fat content averaged 3·07 per cent. The milk from the noon milking was nearly always richest in fat, and that taken in the morning the poorest.

Breeding and Rearing Goats.—Goats generally breed during the winter or early spring. They should be bred when about eighteen months old. The period of gestation is about twenty-one weeks. As soon as conception takes place the milk yield rapidly diminishes and dries up. The usual number of kids is two, though sometimes there may be as many as three or four. If it is not desirable to raise the kids they can be allowed to suck for four or six weeks and then killed and roasted. In flavor the meat, which is tender and white, resembles lamb when it is served with mint sauce. If stuffed like a loin of veal and some bacon is cooked with it, it is also delicious. After the kids are six weeks old they lose their milk flesh and become lean and scraggy. When the kids are to be raised they can be either allowed to suck for a couple of months or (the more preferable way when the mother's milk is wanted) they can be reared on cows' milk, given in a bottle, and by degrees the whole milk can be replaced by skim milk with linseed meal, or by one of the calf meals. The kids are easily taught to drink, and soon begin to nibble at crushed oats and hay.

Goat Skins as an Article of Commerce.—We have no figures as to the number and value of goat skins imported into Canada, but into the United States the importations during the year ending June 30th, 1898, were of the declared value of not less than $15,776,601, or taking the average market price in New York of 39·3 cents per pound, during that year the true value was not less than $25,508,249. Nearly all the goat skins used in commerce and manufactured in the United States are imported, although it is estimated that there are in that country not less than 500,000 goats.

Even if there was no home market for goat skins in Canada it would seem advisable to raise goats for the purpose of exporting skins to our neighbors to the south of us. That market is continually growing, the increase in importation in 1898 being 28·2 per cent. over that of 1897. There is the additional advantage in that the skins being admitted duty free. Besides the profit from the skins there is a further return from the flesh, tallow, bones, hoofs, horns, and the offal, which would probably equal that from the skin.

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* A litre = 61·208 cubic inches; 4½ litres = 1 imperial gallon.

Diseases of Goats.—Goats are probably more free from disease than any other domestic animal. Professor Nocard states that out of over 130,000 goats and kids slaughtered at the shambles of the La Villette, Paris, every spring, the inspectors have failed to discover a single instance of tuberculosis or lung disease, and even inoculation fails to introduce the fatal bacillus into it. The principal trouble from which goats suffer is diarrhœa, due to feeding on low wet land or exposure to damp, colds and coughs when they have been out in rain, and internal parasites when the animal's range has been limited to a small plot of ground which has become foul in consequence. It will thus be seen that the goat, in addition to other good points, is a very healthy animal.

AUSTRALIAN SALTBUSH IN CALIFORNIA.

The University of California, in a recently published bulletin, give an interesting account of the trials carried out at the Agricultural Experiment Station in the cultivation of Australian saltbushes during the past eighteen years, and some notes on the composition and food value, as well as notes from various landowners who have grown these plants for fodder.

The first seeds were received at the experiment station in June, 1881, from Baron von Mueller, and consisted of two varieties, Atriplex vesicaria and A. nummularia, the latter of which, when transplanted on to the salt marshes near Alvarado, grew very well, propagated readily from cuttings, and was much relished by cows, which ate every particle they could obtain. In 1888 seeds of A. semibaccata were received from the Baron, and this variety has been most largely grown in California. As early as 1890 special attention was called by the station authorities to the growth of this variety on soil showing extremely high in alkali, and it was very strongly recommended for cultivation. By 1894 quite a number of farmers in Tulare county had their plots of this saltbush, and specimens of 12ft. to 16ft. in circumference, a single season's growth on strongly alkaline soil, were frequently exhibited at the newspaper offices, it being stated that chickens, pigs, sheep, goats, cattle, and horses throve on the plant, though at first it was somewhat difficult to get working stock and milch cows to accept it.

In February, 1896, at the Tulare Experiment Station six acres of unprofitable alkali soil were drilled in with this saltbush seed in rows 8ft. apart, and by September the surface was nearly covered. A part of the crop was cut twice, yielding at the rate of 4 tons of hay per acre. An irrigation ditch burst and flooded the low-lying land in 1897, and destroyed the saltbush. Equally satisfactory results have been obtained on non-alkali land, and now large areas are used for grazing and for green feed production. The saltbush has grown and thrived where the native spring bulbs, &c., failed to bloom and made but little growth owing to the drought. So high in favor is the plant after extended trial over several years that some landholders have put in as much as fifty acres for grazing purposes. The great value of the Australian saltbushes lies in their resistance to drought and alkali, and their exceeding productiveness. Amongst the other varieties tried and proved of value in California, Atriplex nummularia (growing to 6ft. to 10ft. in height), A. halimoides (grown very largely in Cape Colony), A. leptocarpa, and A. vesicaria are most highly spoken of. The varieties of Kochia have not yet proved a success in California.

Propagation of Saltbushes.—Many of the saltbushes are readily propagated from cuttings, but it is cheaper to raise them from seed. Seed can be sown in boxes or beds and planted out where desired, though more vigorous growth is obtained by sowing the seed where the stand is desired. Plants should be set out in rows 4ft. to 8ft. apart, according to nature of the soil; the plants in the rows should be 1ft. to 4ft. apart. To secure best results from seeding it must be sown and covered lightly or not at all in soil containing a little moisture and *warmth*; in California this means sowing with the first warm autumn showers. Farmers who have attempted to cover the seed on alkali soils almost invariably find that it rots. The seed should be pressed down on to the soil, but not covered. Self-sown seedlings came up in thousands on the surface and even on the roadsides in Tulare district, and withstand severe frost when two to three months old. On hard-pan, light, and arid soils a slight covering of the seed is desirable. During eight years the California Experiment Station has distributed about 2,000lbs. of saltbush seed in trial packets, besides which a great deal of seed has been sold by the nurserymen, but no statistics of area planted are available.

[Note by Editor.—The immense importance attached to the cultivation of our Australian saltbushes in California and Cape Colony contrasts strangely with the apathy evidenced in Australia generally regarding the destruction of these most valuable fodder bushes It is quite the exception here, in South Australia at least, to find anyone attempting to cultivate the saltbushes, though a number of landowners may have a plant or two in their gardens. The Agricultural Bureau has repeatedly offered to supply saltbush seed free to anyone desirous of growing it, but very few have availed themselves of this offer, and most of the seed collected for distribution has been forwarded to other countries, where they are appreciated. Out of the number who did apply for seed not more than a dozen have ever reported results. One of those who forwarded reports, Mr. F. Calf, of Riverton, states that he simply scattered the seed broadcast last autumn on some poor land that had been scarified, and quite a number of plants came up and grew well until the cows got in and damaged them; while Mr. C. N. Grenfell, of Mount Templeton Public School, got Atriplex angulata and A. vesicarium to grow luxuriantly on alkali soil which would not grow wheat, the bushes being 2ft. across in February, 1899, after about seven months' growth from seed. In this colony seeds or cuttings planted after the first autumn rains will probably give most satisfactory results. It is important to bear in mind that the seed must be but very lightly covered. Cuttings may be 9in. to 12in. long, of young firm wood, set 6in. to 9in. in the soil. If the plantation is well protected from stock it will produce large quantities of seed and will rapidly extend in area. The Atriplex semibaccata, so favorably spoken of by the Californians, is a prostrate bush with thin stems and small leaves of pale green, and is found in many parts of the North, especially on the railway reserves where protected from stock, and single plants will often be found covering 4ft. to 6ft. of ground. Cultivation of the land for wheat has entirely destroyed the perennial saltbushes on most of our northern farms. Almost ever since the Bureau was established the necessity for preserving and cultivating our indigenous saltbushes and other shrubs has been urged, but with little avail. The oft-repeated recommendation that several acres on every farm in the North should be set apart and planted with saltbush as a reserve for stock in seasons of drought has met with ridicule from many, but there is little doubt that if some of our farmers would try the experiment they would receive ample reward for their labor and expense. There is no doubt whatever that the saline properties of saltbush greatly tend to keep stock in good health, and although at first it may be difficult when other feed is available to get some stock to touch it, as soon as they get used to it they will eat it with relish.]

FARM NOTES FOR MARCH.

By the Editor.

As the "early bird catches the worm," so the early and bold farmer may get a catch crop of green feed when his neighbors have nothing but dry stuff, and next to nothing of that. Harrow down a few acres of the fallowed land, and sow it with 3lbs. or 4lbs. of White mustard or Dwarf Essex rape, or make a mixture of both, which is better. If early rains occur there will be a strong growth and lots of feed before any natural green feed is available. Next month the main crops of rape, mustard, barley, rye, &c., should be sown for hay, ensilage, green feed, and so forth. The early crops will be used up by end of July, when the land should be heavily manured, ploughed. and finally made ready for sorghum. holcus, dhurra, maize, mangolds, beets, pumpkins, pie melons or other approved varieties of summer fodder. Nothing gives such satisfactory results as are obtained from abundance of succulent food in dealing with all kinds of live stock.

Plants for forage purposes are in their best condition whilst in flower, or immediately after. In growing hay or silage it is best to have a good mixture of wholesome plants and to get them in bloom all at the same time. Wheat and oats should be in flower at 150 to 200 days after sowing; Cape oats, rye, and barley, about 120 days; rape, 100 days; vetches, 160 days; peas, 90 to 150 days; and mustard, 50 days. For the reason stated, it would be necessary to sow the various seeds at intervals. The solid-strawed wheats have a good deal of saccharine matter in the stems, and being also heavy it is desirable to use them for hay.

Where conditions are favorable, plant some early maturing potatoes in rich, light soil, about 30in. between the rows, 12in. between the sets, and 4in. deep. Whole potatoes, about the size of a hen's egg, are best. Try a few rows in trenches 6in. deep, covered with 3in. of rotten straw and 2in. of soil over that.

Heat will crack wood and blister paint, and moisture will cause iron to become rusty, so that threads of screws and nuts will break, and cause implements and tools to work "cranky" and wear and break. When wood cracks it is weakened, dust and water get in and cause rottenness, and when the vehicle, machine, or implement is perhaps most urgently needed for work it has to be in the machinist's hands for repair. The preventive of all this trouble is to place all such things under sheds, keep the fowls off them, use oil on bolts and nuts, and paint upon wood and all iron that should be painted. The cost will be small, the labor light, but the profit or gain will be great.

Take pigs off the stubbles and pen them up for fattening. Do not give them any green stuff, but feed milk, meal, or grain, and peas, if possible. Baconers sell best when 60lbs. to 80lbs in weight; porkers, at 40lbs. to 50lbs. If heavier they do not sell readily, and any extra weight costs a good deal more, proportionately, to produce. The younger the animal the more growth does it make proportionately to the food consumed, and the meat is more palatable.

Put a good lot of manure on a few acres of land, and work it in deeply and thoroughly, for growing crops of turnips, swedes, kohlrabi, kales, cow cabbage, beets, mangolds, &c. Make the land as level as possible, and pulverise it well. Cabbage, kale. and kohlrabi should be raised in nursery beds and planted out. The others should be sown in drills, very thinly, next month. Turnips and swedes do not require so much manure as the other crops.

Every weed in a crop takes the place of a plant that is wanted, and at the same time robs four others of food that is required by them for full development. Not only is it necessary to sow absolutely clean pickled seed for a cereal crop, but the fallow land should previously be scarified and harrowed to kill weeds that are growing there.

Shelter belts of forest trees are necessary on every farm, not only around the dwelling-house and outbuildings, but also around the fields or paddocks. The trees will "rob" the crops within a certain distance, but increase the yields further away. Land should be prepared now for tree-planting by deep ploughing and thorough breaking down of lumps and clods. Protect the area to be planted against trespass by sheep, horses, and cattle. Do not plant in single rows, but in clumps or clusters at 6ft. apart, and remove each second tree when they are 7ft. high. Plant out early in spring.

If stacks are not already thatched, and rain should damage the hay or straw, the neglectful owner has only himself to blame. Stacks should be enclosed and guarded against fire reaching them.

The guttering and down-pipes on all roofing should now be examined and cleared from leaves, dirt, and sparrow nests, else there may be floods within the buildings, and much destruction of property.

Whilst the land is dry, hard, and solid, cart out all well-prepared manure and spread it. New manure, if spread at once, will not lose much of its nitrogen, because it is not oxidised by fermentation, but it may cause the land to become foul with weeds. For hay crops it will pay best to cart all manure on to the fields at once.

Do not let the boars and sows come together now, as there is no profit in having litters come when the weather is frosty, and when there is but little feed for the mothers. Shut the boars up and reserve the strength of the sows till the season is more favourable.

Where cows are wanted to "come in" during summer they should be mated now. Use only a pure-bred bull of some good milking family. If the cow is pure, and of the same breed and character, all the better; but the bull will improve the progeny of any kind of cow.

Get land clean and ready for peas, vetches, rye, barley, oats, and wheat to be sown in April and May. The drill and use of good superphosphate will most probably result in an increase of 100 per cent. on crops sown broadcast without manure.

Red sorrel should be ploughed under at least 5in. Sow a smothering crop on the land for three years, and feed it off each time; then the sorrel will reappear, but will be finally vanquished if ploughed under deeply.

Where so many opinions are extant as to which breed of sheep will best pay to keep it is hard to advise; but, as every authority agrees that it will pay to keep as many as the spare land will carry safely, it is advisable that every farmer should decide to get a flock, and cull and select until he has got the best. See to it that the sheep do not introduce undesirable weeds.

Prepare land thoroughly for sowing next month with grasses and clovers. The deeper, finer, and richer the soil the better will it suit pasture plants. A mixture of grasses and clovers will give the best feed.

Carrots are excellent for horses, and parsnips for cows, in addition to being acceptable on a farmer's table. Deep, light, rich, loamy soil suits them best, but should not be newly manured. Sow seeds in drills at 18in. apart, and be sure to thin the plants to 8in. or 10in. apart Sow only a few rows this month, and put in the main crop next month. Sow a few rows of early peas now, and put in the main crops next month. Sow also some onion seed in a nursery bed for future planting out.

Prepare land for fruit trees and vines by ploughing 6in. to 10in. deep, pulverise well, and mark the places where the plants are to be put in.

Where frosts are not severe get land ready for sowing with lucern. The land must be level, fine as an onion bed, deep, light, and rich. Use a drill and 10lbs. seed per acre. Put in ½in. deep, and then roll it.

AGRICULTURAL BUREAU CONFERENCES.

NORTHERN BRANCHES.

A Conference of Northern Branches of the Agricultural Bureau of South South Australia, convened by the Gladstone Branch, was held in the Town Hall, Gladstone, on Wednesday, February 14, 1900. The following Branches were represented:—Gladstone: C. A. Gallasch, W. A. Wornum, J. Shephard' J. Rundle, J. Gallasch, J. Brayley, E. Coe, J. Tonkin, B. Griffiths, J. King, D. Gordon, J. H. Serjeant and J. Milne. Port Pirie: H. B. Welsh, J. Hector, J. Spain, and J. Laurie. Crystal Brook: W. J. Venning, J. Miell, and R. Pavy. Narridy: H. Nicholls and R. Satchell. Caltowie: A. McDonald. Koolunga: T. B Butcher and W. J. Cooper. Appila-Yarrowie: J. M. Grant and P. Lawson. Wandearah: J. Robertson. Central Bureau Members; Professor W. Lowrie, M.A., B.Sc. (Principal Roseworthy Agricultural College), W. C. Grasby, F.L.S., J. Miller, M.P., A. Molineux, F.L.S. (General Secretary), and Geo. Quinn (Horticultural Instructor); Geo. Jeffrey (Instructor in Wool-classing at School of Mines), E. H. Coombe *(Gawler Bunyip)*, Hon. A. Catt, M.P., E. A. Roberts, M.P , W. Hancock (Mayor of Gladstone), and a large number of other visitors also attended.

Exhibits.—A considerable display of excellent fruits, fodders, &c., was made by the following members:—Mr. Brayley—Apples, quinces, mangolds, wool. Mr. Wornum—Grapes, apples, pears, almonds. Mr. Griffiths—Grapes, apples, peaches. Mr. C. Gallasch—Pears. Mr. Sampson—Grapes and nectarines. Mr. P. Victorsen—Apples, pears, peaches, tomatoes. Mr. J. King—Collection of wheats in straw. Mr. P. Rundle—Collection of noxious weeds and some varieties of wheats.

Chairman's Address.

Mr. C. A. Gallasch (Chairman of Gladstone Branch) took the chair, and in a few well-chosen phrases welcomed the members and visitors. He then called upon Mr. W. J. Venning to read a paper. The following is a very short abstract giving its practical points:—

What should a Man Know about Farming to make it a Success.

The first portion consisted of a eulogy of knowledge, and the necessity that a farmer should pursue and gain as much knowledge as possible. He then proceeded at very considerable length to give his ideas of what a farmer requires to know in order to make his occupation successful. The following "points" have been selected:—The man who is going to undertake farming for a living has either to purchase or lease his farm. Which of the two is the best for a man of limited means with a family? Well, I say lease, because his capital is not tied. If the farmer is a good hand at dealing he can turn his capital over more than once a year successfully. He must take care that he does not pay too much either to rent or purchase his land. The man who pays too much for land will begin life with a millstone round his neck. If he does not by experience know the value and characters of soils he should, before he undertakes to purchase a farm, consult practical men who are conversant with all the details of soils and their productive qualities. The young man who has had life experience in the district will, if he is discreet, only agree to pay for the land what it is known to be worth from the crops previously grown upon it. Land is only worth what it will yield to the farmer by a proper system of cultivation. Some men are induced to take land upon the valuation of the Taxation Department or the assessment of district councils; others will take land in certain hundreds or counties because the statistical returns show well, but the discreet man should consider everything—nature of soil, altitude, liability to red rust, yields in the past in certain seasons, climatic conditions and rainfall, means of getting to market, condition of roads, distance by rail, water supply, and finally the liability in rates and taxes

I regret that some people go on to land without any knowledge of farming, or the necessary capital to carry on their operations to farm successfully. A man must be brimful of energy. To work the farm to the best advantage good horses are required. The following is descriptive of an ideal farm horse, fitted for all kinds of work—for spring dray, wagon, saddle, plough, or machine:—It should have no deformity about the mouth, which should be broad and well shaped to enable him to gather his feed in the field; but he should not be too thick about the jowl; have a broad forehead, short ears—broad at entering the poll. The withers should be fairly high, with a strong, bold crest, showing strength; low withers and crest are signs of weakness. For strength the chest should be broad and round—broad that you could almost wheel a barrow between his fore legs; shoulders bulging out, with muscles stout; short in the body, well ribbed up, with wide strong loins, broad hips, and good quarters, flat bones, not too long in the legs. Farmers' horses are not required to be so heavy as the Lincoln colt; but he wants an active horse after the style of a Suffolk Punch. Now the general farmer will wish to rear a colt or two every year, and he invariably looks for what he thinks is a good sire, but often farmers only put the second-class mares because the best mares work best, and some who put their good mares take them in from the field and work them, foal or no foal. This is cruel, and farmers ought to know that leaving the foals to suck the mare while she is warm is wrong. In this way you often spoil the foal, or rear a sickly horse that is never of much use. To breed successfully, put your best good-tempered mares to a good, sound horse—a horse free from all defects in structure, and when you get a foal you can generally get a good horse by feeding him well. The farmer must not breed defective animals, for this brings him a bad name for his stock; a bad name means a reduction or lower selling value of the products of the farm. He must have knowledge of how to breed, how to store up and feed his animals, and treat them during illness.

With respect to the implements that are needed on a farm, a thorough knowledge of the usefulness of one implement over another is of first importance. In the purchase of his plough he should decide whether it is to be a stump-jumper or a fixed plough, and then which type of that plough will best work the land in all conditions of soil, and will best turn down the weeds. The plough and furrow plate that would do well in the old Mount Barker district will not do on the Gulnare or Broughton plains, so he wants a plough that cuts through the soils, not drag as some ploughs do, and the thinner and the sharper the steel share the lighter the draught. The farmer must know which are the best cultivating implements to work his soil, whether scarifiers or harrows. Under the Bureaus field trials of the several implements now in use should be held upon the different classes of soil we have to deal with. There is an implement called "The Universal Cultivator," on which a share can be put that will move the subsoil without bringing up the bottom to the surface. In my opinion it would save farmers lots of money if they made practical tests of our implements now in use by the side of the newly-invented ones. These tests should be made every year. Take, for example, the test held at Crystal Brook, September, 1898. The ploughs that the judges would hardly look at in the show when tried in the field the day after were found to be by far the best. Farmers of to-day do not encourage these tests as they ought to do. They should give practical inducements to our young men to exert their talents in handling their teams and publicly working their ploughs and showing from experience the advantages of this or that plough over the others under all conditions of soil, bury weeds, and at the same time pulverise the soil. A man purchasing implements would thus have some chance to know from practical tests or experience the implement best adapted to work his land.

In these days of low prices of farm produce were it not for machinery we could not touch farming as an occupation; it would not pay. About cultivation, one of Franklin's maxims was "Plough deep while sluggards sleep, and you will have corn to sell and to keep." Ploughing deep is not applicable in every case, because you are apt in some districts to turn up the sour sandy bottom which was never intended to be on top. Stir the soil to whatever depth you like, but do not bring the bottom to the top. It would not be wise to lay down any hard and fast rule how and when to cultivate, as the climatic conditions vary so much in the several districts of the colony. Just here in this part of the North seems to indicate a necessity to fallow in autumn and winter, and to work the land during spring. Then comes the question of what will pay best to grow or produce—whether cereals or stock—with the least risk of failure and best promise of gain.

There is a story told of an English farmer who would go into his crops of oats and nip off the upper and strongest heads for seed; he was always noted for his great strong crops of oats. In the *Journal of Agriculture and Industry* for July last a paragraph about wheats, recommended flinty wheats for English market; the wheats that were sent to England in large shipments from our Northern Areas years ago that brought us such a good name for wheat and flour were comprised in the varieties known as Purple Straw, Red Straw, Tuscan, Goldsmith's, Talavera, White Lammas, Nonpareil, Purple Tuscan, and Fillbag. These wheats are regarded as soft wheats, and these were the varieties that brought us a good name. The reference to the flinty wheats bringing better prices at home is wrong. [They are not wrong.—GEN. SEC.] Flinty wheats no doubt are the best for rust resistance. When we had to resort to rust-resisting wheats to get a crop, and sent them to the English markets, complaints came from England that South Australian wheats had deteriorated, did not yield so much nor such good flour as formerly. What a farmer really wants to know is what varieties of wheat will sell best in our local and outside markets, and which sort will grow best on his land, resist storms and red rust, and give the greatest yield per acre.

Farmers can greatly add to their knowledge and experience by attending the meetings of the Branches of the Agricultural Bureau, by reading accounts of their doings in the *Journal of Agriculture and Industry*, by exchange of ideas in practice and experiences of all kinds. They should know how to make the best of everything that will grow. If they have room enough they will keep horses, cattle, sheep, pigs, and poultry; stock sufficient to eat up all the grass and weeds that grow upon the farm, and when in a good season they grow luxuriant crops that his stock cannot eat in the field, then gather and store. Now a farmer who knows his business will not, because he has a good season, stock his farm so that all the feed is devoured as it grows, but will, in a good season, store up fodder. A farmer who is also a dealer no doubt to save labor will stock so as to eat up the feed as it grows. Those who have an old stack in a bad season save their stock and hold his own in difficult times. Bad seasons have taught the farmers a lesson they should not forget. In regard to cattle and sheep, what kinds should be kept depends on the country he is on, whether in the hills, in the South, or on the plains in the North, or if he intends to follow dairying only, or breeding, or fattening. The breeds of cattle to keep should be as near to the Shorthorns as you can get, which are best for all purposes. If you want to learn anything learn from the active, successful, industrious, man; imitate the successful man in all things that are good.

Mr. W. C. **Grasby** explained that the chief reason why our wheats obtained so high a reputation was that they were dry and rich in gluten, owing to our hot, dry climate, and such wheats were in demand for mixing with the soft, damp wheats of the more humid climates, as well as for improving the color of the flour. If his memory served him, the gold medal was awarded at the great exhibition in 1868 to Talavera, a large-berried, plump, dry grain, and of much value for mixing with the soft, damp wheats. A Russian gentleman, a miller at Odessa, had told him that Manitoba wheat is the best in the world. He had sent to Mr. Grasby four samples of Odessa wheats, two spring varieties and two winter, all red. In Odessa millers do not buy wheat until its quality has been tested by the testing mill kept for the purpose. In Australia no tests to speak of were made. Milling machinery in South Australia is adjusted to treat soft wheats, and if hard or flinty wheats were to be dealt with the machinery would have to be readjusted for it, and it would not pay millers to do this. Mr. Grasby also said he had sent several lots of South Australian wheats to the above Russian to be tested for bread-making quality.

The **General Secretary** said many wheats had been and were being tested thoroughly by Mr. Guthrie, in the Department of Agriculture in Sydney, and that a flour-testing mill had been imported by our own Department of Agriculture and would soon, he hoped, be actively engaged in testing our South Australian wheats, of which there were far too many varieties in cultivation, many of them of very inferior quality.

Mr. J. **Miller**, M.P., said at one time he used to favor the soft wheats, but found them too liable to red rust. Flinty wheats are more resistant, prolific, and reliable.

Mr. H. **Nicholls** was satisfied that the stump-jumping plough is best for the plains and for rough stony land. On clay soils he would use weights. On such land the old fixed plough left the field in a cloddy condition, and these were difficult to break down; but the stump-jumper almost pulverises such land. Too much was often claimed for supposed new varieties of grain. When a farmer got anything new he generally sowed it in a piece of select soil, under most favorable conditions, and got magnificent results. Returns from general crops are generally more governed by cultivation than by the nature of the soil; but all things being equal the best soil would of course give best results. He had not grown Purple Straw for ten years, as it is so liable to red rust. He favored Early Para, Early Show, Early Wonder, and Leak's Rust-proof.

Mr. **Pavy**, referring to a sample of f.a.q. wheat sent by Chamber of Commerce to London for 1899-1900, said it was a disgrace to farmers. The standard fixed was too low, and ought not to be less than 64lbs. There must have been a lot of wheat *under* 63lbs. mixed with the bulk to reduce the weight and quality of the "fair average quality" to the condition exhibited in the sample sent home. He always ploughed 3½in. deep, with a furrow 6in. wide: pulverise the surface and consolidate the subsoil in order to retain moisture. All weeds should be eaten off by sheep.

Mr. G. QUINN questioned if 3½in. of loose soil would retain 1in. of rain, much less a much larger quantity. In California they had proved conclusively that deep stirring of the soil and pulverising the top 5in. retained most moisture.

Mr. A. CATT suggested that continued ploughing to a depth of 5in. would result in a concrete or "hard pan."

Mr. J. KING said his experience in dry seasons showed that shallow ploughing and later cultivation three or four times, to secure good tilth, gave best results. In one season by this method he had got 25bush. per acre. If the season were wet, the less the land was worked the better.

Mr. GRASBY said in Egypt the farmers used a forked stick with one short arm, charred to harden it, as a plough. They just scratched the soil, and yet secured enormous crops of wheat, barley, maize, dhurra, &c. The English managers in places there could see no reason for this, but had not introduced the modern ploughs.

Mr. QUINN said if land were turned over roughly it would be cloddy below; and if the surface were ever so well pulverised the open cloddy subsoil would abstract moisture from the upper stratum.

Mr. W. J. VENNING had once farmed near the Murray, and ploughed always 7in. deep, but could get no satisfactory crops. His successor ploughed always 4in. and did well.

[Mr. Venning's very lengthy paper and the discussion thereon has necessarily been considerably reduced —GEN. SEC.]

Fruit-growing in Lower North.

Mr. GEORGE QUINN made a few remarks upon this subject. He had not much knowledge of the various localities, but had visited some of the gardens, and was pleased to see the results obtained in spite of the undoubtedly unfavorable conditions prevailing. Respecting horticultural schools, where it made possible for farmers and their sons to learn the general principles underlying every kind of plant requirements and cultivation, much better results would follow than are now obtained in the absence of such education. He thought, however, that there was too much of a tendency in all of the colonies to centralise, and that education in such matters should be more generally diffused throughout the country, where the knowledge imparted could be put into practical operation. Everyone who has tried to grow fruit or vegetables has discovered that the conditions, requirements, and treatment are different to what is wanted in the cultivation of cereals. Throughout our agricultural districts the lads and lasses should learn at least the rudimentary principles of agronomy, which is more important in their sphere of life than the conjugation of Greek verbs and a knowledge of vulgar fractions. At Burnley Horticultural School in Victoria, ladies are educated in theoretical and practical work, and in many cases are more apt in learning than their male competitors. Where there is a teacher capable, our common schools should be the media for imparting such knowledge. Most of the farmers could select some favorable spot on their land upon which to grow vegetables and fruit for themselves—not necessarily for marketing—and thus make the home conditions of their arduous life far more endurable, so that the boys and girls would not be tempted to leave home for the more comfortable conditions prevailing elsewhere, when there are no trees, no vegetables, no flowers, no anything but hard work, hard fare, and a hard life at the place which ought to be home to them. Where the house is erected in an unsuitable spot the garden must be made elsewhere, which involves many disadvantages. Where water can be obtained readily from Beetaloo mains, by pumping with aid of oil engines or steam engines, windmills, and so on, the task of growing things is easy enough. In all cases, with plenty of water or with great scarcity of that element, shelter belts are requisite, else the winds will materially nullify all efforts. In very dry districts the land must be tilled deeply—as deeply as possible—to enable the roots to descend. The under soil must also be thoroughly well broken and pulverised, and the surface to a depth of 4in. or 5in. must be kept in a loose and friable condition to induce and maintain a state of moisture in the soil beneath. For fruit trees manure in moderation is good, but not always necessary. Select perfectly healthy trees from a clean nursery—free from insect and fungus pests— not too many nor too many sorts. In watering try to put it fairly deep down in furrows or circles around the reach of the branches of the trees, not close to the stem, so that it gets to the roots, then fill the furrows with loose dry earth, and keep it constantly loose to prevent evaporation.

Mr. Welch asked if it would pay to use water at 6s. per 1,000galls.

Mr. Quinn: Yes; for a few trees for home use and the comfort and certainty of the produce being absolutely fresh would justify that expenditure. In winter, if wet, break up the soil roughly to to let in air and water, which will greatly benefit the soil. If weather is dry pulverise the soil as deeply as implements will go. If it rains the soil may cake on the surface, in which case, and every time, pulverise with the harrows or other implements.

The Standard Sample of Wheat.

Professor Lowrie directed attention to the standard sample of South Australian wheat as submitted this year by the corn trade section of the South Australian Chamber of Commerce, of which small bottles, under seal, were on the table—one for each Bureau represented. He argued that the present practice was unsatisfactory; that the sample was below the quality of the average wheat purchased at ruling rates, and that, consequently, the whole of our wheat of which the price was determined, except in disastrous years when we had no wheat for export, by the quality of the standard sample submitted in London was undersold by from 1s. to 2s. per quarter. This was a very serious matter, and surely something could be done to lessen the loss. Farmers very generally had held the opinion that it was to their disadvantage to have the standard otherwise than low quality, believing that it played into the hands of the exporters in giving them more opportunity of docking, but this was surely a mistaken notion, as the exporter sold, per cable, generally on the standard sample, and if this were of low quality a correspondingly low price would be quoted to him. The wheat miller who bought wheat at sight would benefit in that; he could buy wheat from the better farmers worth from 2d. to 3d. per bushel more in virtue of its being better cleaned or better grown, and better quality than the standard sample, at the ruling price which the operations of the exporter would determine. Local millers, however, had tried to encourage the better cleaning of wheat by offering a higher price for wheat carefully cleaned, but found that farmers would allow no differentiation, and had to abandon their effort. To bring the standard sample down to 63lbs. per bushel, as has been done this year, much wheat must have been taken in the blending of the sample which weighed less than 63lbs., else how could the average be 63lbs. As the practice prevailed of taking the average of the samples as the standard sample, and making that the minimum quality for ruling rates, the average of the shipped wheat must necessarily be over 63lbs. Thus a proportion of every shipload might be made up of wheat purchased at reduced rates as being below 63lbs., and yet the whole might be sold at ruling rates as the average would be up to standard quality, and a throw-in for the exporter secured of so much as was the total amount of docked wheat in the ship. This might not be done, but it was possible, and the possibility should be withdrawn. Again, the present low standard gave no encouragement to farmers to thoroughly clean their wheat, as wheat 66lbs. to the bushel had to be sold at the same rates as wheat only 63lbs. per bushel. Some reform was certainly desirable in the interests of farmers and farming. He would suggest that our wheat be sold in two grades, No. 1 and No. 2—that South Australian No. 1. wheat be clean, sound wheat, free from bunt or stinking smut taint, and weighing 64lbs. (or 65lbs) per bushel, and South Australian No. 2 be 61lbs. per bushel and of lower quality—and that the standard be constant from year to year.

Mr. W. J. **Venning** felt sure that if the South Australian Farmers' Union would erect the necessary grading and cleaning machinery we would get much better prices. He had heard of Petatz Surprise wheat going up to 72lbs. per bushel, and another—he thought it was Bluey—also went very high.

Colonel **Roberts** thought there should be a conference of farmers, millers, and wheatbuyers to fix the standard.

Mr. **McDonald**, Caltowie, had been a wheatbuyer for over twenty years. Some farmers had requested that the sample of wheat of the locality to be sent down to the Chamber of Commerce should not be "too good." The f.a.q. sample sent up by the Chamber was not representative of the district. All he had bought this season was worth quite 2d. per bushel more than that shown.

Mr. E. J. **Hector** wished to know if the gluten strength of our wheats is now as high as it used to be in the early days.

The **General Secretary** said that in olden times the gluten strength of South Australian wheats ranged up to 12 or 13 per cent., but owing to depletion of organic matter or humus in our soils the gluten strength had greatly decreased. This, however, would now probably be reinstated by the use of commercial fertilisers.

Professor **Lowrie** repeated that the f.a.q. sample was not fair to this colony. Our wheats are used to improve the color of inferior wheats. The dark-red winter wheats are very strong, but produce a dark flour.

After some further discussion and repetition by other speakers, Professor **Lowrie** moved—"That we, as a conference of farmers, think that the time has arrived for an inquiry whether it is practicable to fix a constant standard for wheat, to be graded as No. 1 and No. 2."

Seconded, and carried unanimously.

Professor **Lowrie** moved—"That the Central Agricultural Bureau be requested to arrange for a meeting of farmers, millers, and wheatbuyers to decide whether the proposed change should be made, and to fix the constant standard if the proposition is approved."

Seconded, and carried unanimously.

Diseases of Wheat.

Professor **Lowrie** then gave an address upon this subject. He remarked that there have been very extensive losses this season through the prevalence of bunt in our wheat crops. Some people had suggested that this disaster was attributable to the use of the drill, to the agency of fertilisers, as well as to several other unlikely causes. Bunt was a fungus parasite of cereals, produced from spores or seeds year after year, just as all other plants are produced, and is amenable to perfect control if the proper means are adopted. [A voice in a dark corner—"I do not believe it." (Laughter).] He would go further, and say that he believed it to be possible, by consistent effort, to eradicate it altogether from the colony. If farmers would take all proper care in pickling and after-treatment, and not use badly-bunted seed, their crops would be free from the disease. It is difficult to deal with unless the method adopted is strictly accurate. The seed should be first run through the blower to remove bunt balls and as many foreign seeds as possible, and thereafter treated with a solution of bluestone carefully prepared. It was in the preparation of the reagent that mistakes generally were made. When some slight evidence of stinking smut was in the wheat a 2 per cent. solution should be used, *i.e.*, 2lbs. of bluestone to 10galls or 100lbs. of water; but when such evidence was altogether absent, 1½lbs. of bluestone dissolved in 10galls. of water was sufficiently strong. Different methods of treatment were adopted, viz., (*a*) steeping the wheat in a gunny bag in the solution, (*b*) sprinkling the wheat on the floor with the solution to a degree sufficient to moisten every grain, and very thoroughly turning and re-turning the heap. In stripping or thrashing many of the bunt or stinking smut balls are broken, and as each ball contains a vast number of spores, these spores, individually microscopic and invisible, are distributed over the clean grain in numbers often sufficient for the mass of them to darken the downy end of the grain and taint the sample. Thus most careful treatment is necessary to prevent the germination of these spores, for when omitted the spores germinate and the fine threads or spawn enter the young soft shoot of the germinating grain. These threads traverse the stem or stems as they develop, and ultimately, when the plant comes into ear, the very finely attenuated threads of spawn enter the ovary and fructify or form spores in the embryo grain, which spores ultimately absorb or use up all the elaborated material that would ordinarily go for the formation of the grain, leaving only a thin outer case of the grain, which envelops the mass of spores. Self-sown wheat is generally free from stinking smut, as the spores will have germinated under the influence of some slight shower which was not sufficient to germinate the wheat, and, finding no available host, will have died. For a similar reason, wheat sown on dry land is less liable to stinking smut, the spores having germinated from the presence of moisture sufficient for their purpose, but not enough to bring away the wheat. The bluestone solution will lessen the percentage of germination and retard the brairding of the crop. On this account to secure rapid germination, and at the same time a good percentage germination, hot water treatment has been recommended. Take two tubs, one with water at 120° F., and the other with water kept at 132° F. Dip the wheat in No. 1 a few times quickly; then immerse in No. 2 tub, and keep it there for ten minutes, only lifting up the receptacle containing the wheat once every minute to allow of draining and returning it again until the ten minutes be up; then spread out the grain to dry. This method of treatment requires the use of thermometers, and is not so handy for farmers as the bluestone treatment. The thermometers must be frequently read to make sure that the water is being maintained at the proper temperature (132° F. to 133° F.) and that it is not raised above 135° F. This hot water treatment has been recommended by the Pathological Department of the United States of America. Loose smut or smut proper is a fungus different from bunt or stinking smut. It is more difficult to destroy than bunt, and there are several kinds of it, affecting chiefly oats and barley and sometimes wheat. The spores of loose smut float in the air, and some may fall in the embryo grain, and in the process of the growth of the grain become enclosed within the grain covering or husk. In this case bluestone is inefficient. For oats American authorities recommend the following treatment:—(*a*) Dissolve 1½lbs. of potassium sulphide in 25galls. of water in a wooden vessel, and steep the oats therein for twenty-four hours. Do not use the solution more than three times; or (*b*) adopt the hot water treatment as recommended for stinking smut in wheat. For loose smuts of wheat and barley the hot water is also recommended, but with modification. The grain, it is advised by the American authorities, should be soaked for four hours in cold water, allowed to stand for another four hours in wet sacks, then dipped for five minutes in water at 132° F. in the case of wheat and 130° F. for barley. My own experience of the hot water treatment has hitherto been less satisfactory than that from bluestone, but I followed the recommendations of Jensen, a Norwegian expert, who first suggested the use of hot water as far as I know, and the treatment has been modified since its first introduction. Ear cockle is a disease fortunately not at present very prevalent here, but one that must be guarded against introduction into our fields. If suspected to be amongst the seed, put it through the blower and carefully burn the cockles. It is caused by a minute eel-worm, great numbers of which are to be found in an apparently lifeless condition in the grains which would have been grains of wheat had they not taken possession. Upon being damped these cockles (they are also called "purples" and by many other names) quickly become active, and if the cockles are sown on the fields the worms separate and attack any wheat plants, entering the substance of the young plant, and finally entering what should become grains of wheat, where they become sexual adults, and the female lays eggs which develop into minute worms, absorb the grain matter, and fill up its place with a mass of coiled-up worms, which become dormant and apparently dead and dry. Bluestone is not efficacious against this disease. They are thus practically very difficult to deal with, and therefore great care must be taken to prevent their introduction into our fields It is well to avoid the seed altogether.

Mr. W. J. **Venning** said he always uses the 10 per cent. solution of bluestone, and sprinkles it over the seed on the floor.

Mr. J. **King** had noticed that he got more bunt when he used superphosphate than when he applied Thomas phosphate, and that black rust occurred most frequently when the seed is sown on dry soils.

Professor **Lowrie** supposed that the super., being far more easily soluble than Thomas phosphate, it dissolved sufficiently with a little moisture to afford nutriment for a time to the bunt.

Mr. **Quinn** suggested that the rapid growth in the young wheat plant induced by the readily soluble superphosphate enabled the parasitic fungus to more easily find its host and to quickly develop its own vitality.

Conveyance of Stock to Adelaide.

Mr. E. J. **Hector**, on behalf of Port Pirie Branch, directed attention to the necessity for an alteration in the railway arrangements for conveyance of live stock to Adelaide; and after a good deal of discussion as to whether a memorial or representation to the Commissioner of Railways would or would not be more effective in bringing about a reform, the following resolution was adopted:—"That the Commissioner of Railways be requested to run a "B" van, with movable divisions for sheep, lambs, calves, and pigs, every Tuesday from Port Pirie to the Adelaide market at reduced rates for single animals."

Wool-classing and Care of Sheepskins.

Mr. Geo. **Jeffrey**, Lecturer on Wool-classing for the School of Mines and Industries, addressed the meeting to the following effect:—

After having dealt with the structure of the wool fibre and explained the bearing of several of the leading characteristics of wool to the manufacturing of cloth, the lecturer devoted himself to wool-classing, which, he said, proved that the work paid the grower provided that the work was done in a careful and scientific manner, and the wool was not divided up into too many sorts. This also applied to the small sheep farmer, only in his case sub-divisions would be comparatively few. The following advice contained all that would be required by the small farmer with his few hundred sheep:—The shearing must be done on a clean floor, as the practice of carrying out this work in a dirty shed or barn was objectionable, for by such practice the wool got mixed with all the dirt lying about. As it was of the utmost importance to favorably impress buyers, all fleeces should be skirted regularly, not necessarily deeply; in fact, in many cases, only the dirty edges needed taking off. In other lots, such as wools of very light condition, it might pay to skirt off all the burry pieces, &c., as by so skirting it was possible that the lot might suit the requirements of the American buyers, who, when in the running, were not afraid to pay a good price for wool which suited them. The fleeces should be rolled neatly from breach to shoulder, and they should never be tied with string. In a case where merino and crossbred sheep were kept, it was advisable to shear them apart, so that the wool from each lot would be kept entirely separate. No further attempt to class the fleeces was necessary, except in the case of the merino, where there might be an extra heavy matted or discolored fleece, which should be broken up and mixed with the skirts. Or, in the cross-breeds, in the event of a fleece being extra coarse it should be kept with the pure-bred Lincoln or any longwool which might have been used in crossing. It was well to pack bellies, pieces, locks, and stains separately, even if they had to be packed in pockets or bags, for mixed lots seldom brought their full value. Although it might be an advantage, it was not a necessity to have a box press, but care must be taken to pack the fleeces carefully, and tread them down in such a way as to fill up the bale and make it look tidy, but the bales must not be too heavy. The bales should be branded legibly, with the name of the farm or owner, as insufficient branding often led to trouble, and they should be numbered consecutively from the first to the last of the clip. It was a great mistake to attempt to confine selling brokers to limits, as those gentlemen knew the value of wool and would not let it go under the price it ought to bring.

Referring to the care and preparation of sheepskins, Mr. Jeffrey stated that much money was lost annually through negligence in this respect, but if the lines advocated were followed much would be saved, viz., kill the sheep on draining board or some clean place, remove the skin immediately after killing to prevent blood from collecting in the veins and thus staining the pelt. In skinning, use the thumb more than the knife so as not to cut the pelt. As soon as the skin has got a little crust on (generally an hour or two after killing) paint with an anti-weevil solution.

In answer to Mr. J. M. Grant, Mr. JEFFREY said farmers should skirt fleeces moderately, but evenly, not too deep, and do not mind the burrs.

Weevil Wash.

Mr. JEFFREY said the following is an excellent wash to prevent weevils attacking skins:—Put 8galls. of water into a copper with 10lbs. of soda ash, ½lb. Barbadoes aloes, stir them well until boiling, then add 15lbs. of arsenic. The mixture will rise like boiling milk. To prevent boiling over, have some cold water handy to pour into copper. One part of the mixture to five of water will be sufficient, and, seeing that the solution is poison, great care must be exercised. After thoroughly painting, that is touching every part of the pelt, hang the skins up to dry. This must be done in the shade, and care must be taken to have the skins as shapely as possible. In the absence of a frame the best way is to hang the skin over a rail lengthways from head to tail, a few inches apart. When dry, pack skin to skin, the wool being on the outside, and don't make the bales more than 2cwts.

How to Occupy Land Profitably.

Mr. J. M. GRANT read the following paper:—

This is a vital question. How are we going to answer it? Some tell us to try a rotation of crops. Wild oats and cockspur, with a sprinkling of stinkwort, is the rotation practised about here, followed by a crop of wheat every second or third year. I do not say that this is the best way, but it seems to be the kind that pays us just now, as the land appears to keep in good heart, and it enables the farmers to keep sheep and other stock. But what we really want is something to sow on the fallow land broadcast and harrow in during September. As most farmers harrow their fallow there would only be the additional expense of seed and sowing, and it would be a great boon to have a green bite for the stock during the summer months, if it can be had at not too great a cost. We have often been told by our General Secretary to drill in sorghum and work it up with the horsehoe. As most of us have from 200 to 400 or 500 acres of fallow land every year that would be rather a big undertaking. [I never advocated the sowing of more than a few acres—sufficient for green feed and ensilage as a stand-by. —GEN. SEC.] Sorghum seems uncertain if the summer is dry. I put in some on land manured and sub-soiled. I dropped the seed in rows, and scarified between them, but the season proved too dry for it, and the stuff that grew the best was sunflower. Some of them stood 6ft. and 7ft. high, while sorghum in parallel rows were only 6in. to 30in. high. Cows are very fond of sunflowers as forage. I have sown lucern for three years, the first lot about an acre, the other two lots somewhat less. I had all manured and sub-soiled, but am sorry to say it was only a partial success. I planted about 900 vines, and am glad to say they have grown very well indeed. I asked a well-known fruitgrower if he thought they had done well, "Yes, they have," was his reply then. The last dry seasons have had an adverse effect upon them, but I think every farmer ought to try to grow enough fruit for home consumption. "Pooh, pooh, cannot be done, land not suitable," some will say, and others, "Insufficient rainfall," &c., but my opinion is that nearly every farm—perhaps all—have suitable land for growing vines and fruit trees, and if people will devote some time and common sense to fruit culture we will see vineyards and orchards all through the district, which will greatly add to the health of the settlers and families, and so save doctor's bills. It would be a great blessing to all if we could have fruit of our own growth on our tables, either fresh or preserved, all the year round, even if we had to grow a little less wheat. There would be more rosy cheeks and not so many dry looking old faces about the country. Fruit tastes better direct from the parent branch than after it has been hawked about two or three days.

Upon the merits of deep or shallow ploughing I will say but little. Every farmer ought to be the best judge of the depth most suitable, as so much depends on the nature of the subsoil. I think 4½in. or 5in. is deep enough to fallow most of the soil in the hundred of Appila. The fineness of the tilth is of more importance than the depth My meaning is that it is better ploughed shallow and worked up fine than ploughed deep and left rough and lumpy; I prefer fairly deep culture where the condition of the land is suitable. There is one thing in favor of shallow cultivation: it is certainly easier on the horses and is better for germinating the wild oats and other weeds; whatever depth the ground is ploughed it ought to be worked fine. Every farmer should have some sheep if only to keep his fallow clean, and it would pay him to sheep proof his fences. It is usual for people to say, "Oh! they starve the other stock," I say, "No," if you do not make the mistake of getting too many. With a little judicious management sheep can be kept without encroaching much on the pasture of the other stock. Sheep will do well in a stubble paddock after the other farm stock have got tired of it. They will eat almost any kind of herb, and what a lot of labor they save the horses in preventing weeds from shedding their seeds. Then how convenient it is to have a sheep to kill when you want a bit of fresh mutton; and there is the wool money, which helps a good deal. As times are now, farmers ought to try to produce on their farms nearly all they eat and drink; of course they cannot produce tea and coffee. Then there is flax culture; I think we might give it a trial. It probably would pay farmers to keep a number of pigs and export frozen pork to England. Pigs would pay if we were sure of 3d. a pound for the carcass on the farm, and 60lbs. of wheat is said to produce 16lbs. of pork. Every farmer ought to make at least enough butter and cheese for home consumption all the year round. Then there is poultry. Some people tell us they destroy more than they are worth. I admit that they cause trouble and do some damage occasionally if they get the chance. However, they are profitable if you do not get overstocked. We must not despise small things for we will have to be economical and make the most of everything. If in farming it is going to be a case of the "survival of the fittest," then let us be among the survivors.

There was no time for discussion.

Growing and Preserving Hay.

In the absence of Mr. C. A. Phillis, Mr. D. Gordon read the following:—

Preparation or Cultivation of Land.—The method of earlier days—ploughing and seeding the same year—is now, or should be, extinct, continual cropping having exhausted the soil of those elements needful for growing plant life, and we must, therefore, assist nature to recoup the virtues so deficient; and fallowing as early as possible after the harvest is garnered is advisable, that all moisture may penetrate the soil to some depth which is not evaporated immediately the warm weather comes. It is further necessary to thoroughly work the fallow by well-scarifying, harrowing, or similar cultivation, to make a good seed bed—firm, and yet friable. It is, of course, diplomatic to use discretion when to use scarifier, &c., so that one can destroy the Buckjumper oat and any other rubbish which are preferable by their absence in a growing crop.

Wheats Suitable for Hay.—White Tuscan and Scotch Wonder: These wheats, from my experience as a chaff merchant, are without an equal, straw being clean, good color, cuts a good bold chaff. Red Straw and Purple Straw I would couple with above kinds for similar reasons. Budd's Early: Apparently a capital kind for hay, seeming to weigh well, a good color, one probable objection being rather flaggy. This wheat is said to be very hardy, which is a point in its favor. I should think it belonged to the Ward's Prolific variety, but ties and holds together better in the bands. Early Wheats: In ordinary seasons Early Para is very suitable;

coming away well at the start, it gets ahead of rubbish, and can be cut while the Buckjumper oat is green in the head, which is of very great importance in cleaning land. King's Early, No. 1: A wheat that weighs well for hay, of good growth, splendid green color (in fact, the greener in color of any kind), very sweet, containing a lot of saccharine. One objection to feeding long or in chaff, without mixing with other kinds, is the beard. A still further objection on my part, as a buyer is—ties very badly, shrinks after cutting, and slips out of bands without any reason. This refers to Early Para also. Steinwedel: The market value of this should be under the before-mentioned kinds, because of loss of grain in stacking and handling, and do not recommend this kind for hay. Note.—The generality of farmers have an impression that the dirtier crops only should be cut for hay, quite overlooking the necessity of cutting sufficient good clean wheaten, so that the two mixed would make a good sound merchantable chaff; further and a good sound feed chaff.

Binders—To do good work it is imperative that the machine be in thorough working order. To partly overcome this, what seems to me great difficulty, I would suggest the machine (all machinery) be attended to as soon as harvest is finished, and have those parts requiring attention attended to at once, and not left stand over for an indefinite period when one has quite forgotten; and instead of telling the machinist what is required leave it to the said machinist, who can run up a good big account for doing but little repairs but lost time for inspecting. Further, it is urgent to have machinery give any satisfaction, that it be well housed, and not left out in the open for an indefinite period. I would also impress on the minds of farmers present the necessity of tying sheaves well; to allow your binder to tie slovenly seems to me bad generalship, and also causes loss to the producer and the purchaser.

Twine—It is advisable to use nothing but best quality, as time is often of the very greatest importance during hay harvesting in getting crop down quickly when ready, and inferior twine is often the cause of greater loss than the value of it through continual stoppages and wasted time.

Sheaves should be tied of fair size—one adjusting size to length of crop; but often no heed is paid to this very important question. Long hay will stand being tied into big sheaves; short hay would be better if tied smaller.

When to Cut Hay for Sale.—Would advise cutting as soon as the bloom on the ear dies; this is to secure hay being good green color. Hay for own use, should recommend a little more forward and containing some grain; that is when intended to chaff; for feeding, long. I cannot speak on this subject with any certainty.

Stooking should be done directly behind the binder, *i.e.*, not allowed to lie about longer than half a day, providing it is quite dry. Stooks should be made of a good fair size, allowing ventilation and still preventing too much surface exposure to the sun; this secures the hay keeping good green color and retaining the substance. But when hay is coarse in growth and green, would advocate smaller sheaves and smaller stooks; otherwise the centre sheaves of stooks will not be seasoned.

When Seasoned, or Ready for Stacking—The straw should break clean about the middle knot and taken from the sheaves in centre of stook; if stacked where knot bends only, it will cause heating and the hay looses its bright green color, and generates a black smut and musty smell, and a dull sage-green color. This is often noticeble with hay stacked by farmers. Of course we know hay, if thoroughly seasoned, weighs lighter; and if the buyer will accept hay not thoroughly seasoned it is very tempting to the seller to deliver hay unseasoned. I recommend the cultivating of Algerian oats, Cape, or some other fine straw oat, for feeding the working stock, or at least as a change from the wheaten hay. We should remember horses like a change of food as well as ourselves.

Stack-building.—I strongly recommend, where practicable, ploughing where intending to build stack; also trenching close into stack after built, to prevent water running under stacks, and being ploughed also tends to absorb the moisture. As to building stacks, I cannot speak with any authority, apart from the fact that when hay is likely to be removed within six months after building should recommend heads out when topping.

Wire Netting.—This every farmer should use on stack in farm yard, to prevent fowls starting thatch and making holes for the wet to run in, and, further, it prevents the wind shifting the thatch. I have used 6ft. wide along ridge of stack, and am satisfied it is the right thing. I would add: any little extra care used in stack-building will repay the trouble taken.

Salting.—A leading chaff merchant in Adelaide stacked hay during wet weather, and to prevent pulling stack down used fine dry salt, and it was a marked success, the hay coming out of stack in splendid condition. Farmers must not run away with the idea that hay was not seasoned. It was seasoned, but wet weather came on while building stack: salt was used as a resource and turned out successful.

Mr. J. King said he had sprinkled dry salt on hay and straw, and it came out as dry as when put in. Some chaffcutters were in the habit of using salt when the chaff was too wet. For hay the early wheats should be sown, and Tuscan was one of the best, but the main portion of the crop should be of the early sorts. Bearded wheats should be cut whilst the ears are quite soft. Solid straw wheats are rather difficult for the binder, as the sheaves have but little spring in them and tie like a log, besides being glassy or slippery.

Professor **Lowrie** agreed generally with the writer, and would prefer the early wheats for hay. He had fed a great many horses and for lengthened periods on bearded wheat hay, and had no trouble with them. It was only necessary to pay ordinary attention to their mouths occasionally, as was done when they were fed with other food. Horses greatly prefer the solid-straw hay, and it does not contain as much fibre or cellulose as the soft hay does. It is theoretically correct to cut hay soon after the bloom has dropped, because good color is thereby secured; but most people look to quality, and like to have a fair quantity of grain in the hay, and cut it when in the milk or early dough stage. If hay is damp or in silage it would be improved by the addition of about 28lbs. of salt to each wagon load. He used to think Medeah the most profitable wheat he could grow, and had got as much as 4 tons of hay per acre from it. For grain he had obtained crops up to 33bush. per acre; but he could not obtain a change of seed, and had perforce to give up growing it. Medeah is a fine macaroni wheat, rich in gluten, rather flinty; makes an excellent chaff, and the stubbles are eaten clean out by stock, whilst other straw adjacent is left untouched. The wheat which was once supposed to be the Medeah was most probably an Australian Poulard.

Mr. **Quinn** said he had seen stacks of straw sprayed layer by layer as they were built, with a solution of molasses in water.

Another speaker said it was the practice to mix molasses, salt, and sulphate of iron in water, and sprinkled on the layers in the stack as it was being built. The use of the spraying machine was an improvement on the watering pot.

Noxious Weeds.

Mr. T. B. **Butcher**, for Koolunga Branch, directed attention to the prevalence of noxious weeds in various localities, and to the difficulty in many instances of securing conviction and enforcing penalties for neglect to comply with the provisions ot the Act, The Barnaby thistle (Kentrophyllum lanatum), wrongly called "Star thistle" by many in the district, was brought down by floods of the River Broughton and spread over the lower country. It is "noxious" within the meaning of the Act, and three members of his Branch had gone out and cleared 300 acres of it. The district councils had also in places employed men to destroy this and other noxious weeds, but private owners of land often neglected notices to clear their properties of these weeds, and when prosecuted they generally escaped penalties. Cases had been known where persons had pleaded guilty to neglect, and yet the justices of peace had dismissed the informations. It had been suggested that where a justice is a tradesman or storekeeper he would not care to penalise a customer. The Act should be altered in clause 2, and in place of making it optional the magistrate should be obliged to impose a penalty on any person convicted or pleading guilty to neglecting or refusing to destroy noxious weeds on his land. As it is the district councils and corporations are averse to prosecuting because it is almost impossible to secure a conviction.

A member said that Government lands everywhere were covered with noxious weeds, and no end of representations had been made upon the subject without any effort being made to eradicate them. Another member said that the whole colony was being over-run with various declared noxious weeds, which were allowed to spread without interference. Many new weeds were spreading rapidly, such as the toad flax, field poppy, charlock, Homeria (a deadly poison), buglos species, Euphorbia lathyris, and others, but before they could be declared "noxious" the consent of both Houses of Parliament must be secured; then a proclamation must be published in the *Gazette*, and after that no provision is made to enforce the provisions of the Act, so that the weeds go on increasing till the land is ruined.

After a deal more of discussion, the following resolution was unanimously adopted:—"That this Conference desires that consideration should be given by the Hon. Minister of Agriculture and Education to the question whether power should be given by Act of Parliament to local governing bodies to declare any weed newly found within the boundaries of the district under their control a noxious weed within the meaning of the Act, and to take means for its extermination."

It was also unanimously resolved—"That the various Branches be asked to unite to secure the repeal of that portion of clause 2 of the Noxious Weeds Act, 1862, beginning with 'provided also that it shall be lawful for the justices to suspend any conviction,' and members agreed that the provision that all notices *re* noxious weeds must be 'written' is oppressive on municipal and district clerks. They should be allowed to use printed forms, with certain parts filled in by writing."

Next Conference.

It was unanimously resolved that the next Conference of Northern Branches shall be holden at Gladstone about February, 1901.

Thanks.

A comprehensive vote of thanks was carried amidst much acclamation to all persons who had in any way contributed to the success of the present Conference, the organiser (Mr. J. Milne) being especially mentioned.

FAR NORTHERN BRANCHES.

The third Conference and Exhibition of Products of the Far Northern Branches of the Agricultural Bureau of South Australia was held at Quorn on February 16. The following Branches were represented:—Quorn: R. Thompson, Jas. Cook, G. Altmann, C. Patten, F. Herde, H. S. Stacey, J. Rock, J. B. Rowe, Jno. Cook, and A. Noll. Arden Vale: C. Pearce, F. Shuttloffel, M. Eckert, D. Liebig, M. Searle, J. Warren, J. Venning, and E. H. Warren. Richman's Creek: W. Freebairn, J. McColl, H. Kelly, A. Knauerhase, J. J. Searle, J. O'Donohue, J. Gebert, J. Nicholas, E. Roberts, J. McSkimming, and J. Koch. Amyton: S. Thomas, and H. Gray. Cradock: J. H. Lindo, H. Patterson, P. Gillick. Carrieton: J. W. Gleeson. Davenport: J. Roberts, W. Hodgson, and J. Holdsworth. Johnsburgh: F. W. Hombsch, G. H. Dunn, and W. McRitchie. Wilson: J. McNeil, R. Rowe, and W. H. Neal. Woolundunga: N. Rogers and H. Aldenhoven. Wilmington: G. Schuppan, W. Slee, H. Noll, J. Hutchens, R. Cole, and C. Baker. Hawker: S. Irvine, J. O'Loughlin, J. Hill, H. M. Borgas, J. Smith, and R. Wardle. The Central Bureau was represented by Professor W. Lowrie, M.A., B.Sc. (Principal of the Roseworthy Agricultural College), and the General Secretary (A. Molineux), and Messrs. G. S. Thomson (Dairy Instructor), and G. Jeffrey (Lecturer on Wool-classing for School of Mines and Industries), with several members of the Ministry and of the Parliament were present at times.

Exhibits.

By members of Quorn Branch—James Cook, figs and grapes; by R. Thompson, nectarines and cobs of maize; by G. Altmann, cabbages, apples, cucumbers, and tomatoes, also enormous plant of tomato; J. Willoughby, grapes; A. F. Noll, wheat in straw and clean grain, and sorghum which had neither rain nor irrigation, very fine sample; J. N. Williams, American Pound peaches, grown without irrigation. Wilmington Branch—R. G. S. Payne, white Kaffir corn; by H. Noll, apples and pears (without watering); and R. G. S. Payne, apples. Cradock Branch—H. Iredale, grapes grown with irrigation. Carrieton Branch—W. Gleeson, wheats (grain). Richman's Creek Branch—J. McColl, wheats in the straw and clean grain; W. Freebairn, a large ham and samples of hay. Johnburgh—G. H. Dunn, samples of smutty wheat, before and after treatment by a newly-invented smutting device.

Preliminary.

Mr. R. Thompson, Quorn Branch, took the chair, and in a few words welcomed the representatives of the various Branches and the visitors. He then called upon the General Secretary to read a paper written by Mr. R. G. S. Payne, of Wilmington Branch, as follows:—

FRUIT CULTURE AS ADAPTED TO OUR NORTHERN CLIMATE.

This is a very important subject, and well worthy the careful consideration of both large and small landholders, but especially so to the man with a limited area of land. There is so much being said to-day in favor of closer settlement that such a subject as this short paper puts forth would most fittingly further that object. It is a serious mistake to conclude that because ours is a climate with an uncertain rainfall and subject to periodic hot and devastating winds that fruit culture can only be successfully carried on to the south of Goyder's rainfall. There are many spots in our upper Northern Areas where fruit for local purposes, as also for canning, could be most profitably grown. I wish at once to say that I am not advocating an indiscriminate cultivation of fruit. There are vast tracts where it would be madness to attempt to grow fruit successfully, unless it might be a few vines, which could be trellised round some sheltered portion of a house or other building, where they would have protection from hot winds, and so close to the house that the waste water therefrom could be conveyed to them so as to offer a stimulus to growth. How frequently it is the case in our north country that you travel for miles without seeing any signs of fruit culture, and also how frequently you meet with the statement that "Fruit will not stand the heat and uncertain rainfall." I venture to say that there are few spots where the owner of a home, if he chose, could not successfully grow a couple of vines, say of the Muscatel or Sweetwater varieties, and, perhaps, also a few fig trees. But I wish to qualify this statement by saying that something more must be done than simply digging out a few holes, planting a few vines or trees, and then expecting them to grow and thrive as in the south. Certainly if this only were done then failure in the great majority of cases must ensue. When the climate and situation are not congenial to a general planting, and there is the intense desire to possess a few fruit-bearing vines or trees, this can be effected if the parties will go to a little extra trouble and show some amount of enthusiasm at the start. In such localities as I have just referred to I would only recommend a few vines or figs being planted, and those only in a very sheltered position, and under the following conditions of planting:—

1. *Vines.*—If alongside a verandah or wall of some building, being sheltered from the north winds (as such a site only would be suitable), then first let there be good excavations made of at least a cube of 3ft., namely, 3ft. x 3ft. x 3ft. This having been done, let the base of the holes be well loosened by the application of a sinking bar to as great a depth as can be reached without removing any of the soil. Then as this work will be done in the winter time, when surface water can be easily obtained, let the holes be filled with water again and again until the ground beneath becomes saturated. This being over, gather together a quantity of old bones and let them be broken up to about the size of top road metal, and let the base of each hole have a coating to the depth of about 3in.; next, if the soil taken out be rich, let it be mixed with a barrow-load of well-rotted stable manure, so that the soil put back will be loamy and friable. Do not put back any clay if it can be avoided. Should the natural soil not be loamy, then let such be made by mixing the natural soil with equal parts of well-rotted stable manure and the small rubbish from an old wood heap. Do not refill your excavations until you are ready to plant, so that the

subsoil may have the benefit of the rainfall. Just before planting refill your holes with the prepared soil, and if not moist, give a little water as you proceed, but do not make the soil sloppy or sad. Be careful not to step on the soil you put into the holes, but use an ordinary pronged fork to chop about with, so as to bring the soil compactly together. When less than half full, have for each hole two (2) oil or nail drums, (or if you choose—earthenware drain pipes) with the top and bottom cut out, and place them at opposite diagonal corners thus ⧅, so that as the dry weather approaches, and through the summer, the waste water from the house can be poured in at the mouths of the tins, and the moisture will thus find its way down to the subsoil. Now the rest of the filling in can be done, but only fill in level with the surface. Next, always supposing that what you are about to plant is strong and healthy, take your plant in your left hand, and with the right open out the roots, so that they shall be perfectly disentangled. Should any of the roots have broken ends, then take a sharp pocket-knife and cut the blunted ends off. Spread the roots out perfectly flat on the surface, covering with about 1in. of your prepared soil, and pat down slightly with the hand. Next, put round the sides of the hole anything which will confine a coating of stable manure with a little straw in it to the depth of 2in. or 3in. Any water you pour on this mulch will readily pass downwards, and will keep the ground nice and moist for the young roots to feed through. Your plant will now be about 4in. below the surface, which is deep enough. So as to guard against frosts, or other accidents, you might surround your plant with some old tub, or half a cask, being open at the top. If such methods of procedure as the foregoing are adopted (which I admit involve trouble and labor), then I venture again to say that even in such comparatively arid spots luscious fruit could be obtained. Before I leave this part of my subject I would say to the planter, do not suppose all has been done. Throughout the summer water must be conveyed to the plants, as nourishment in infancy is everything to a future tree, but the wife or children would gladly and with pride do this.

2. *Figs.*—In planting a few figs that can be watered act very much in the same way, but let a stake be driven into the subsoil at each of the four corners of the holes before filling in, so that some bagging and wire netting can be nailed round for the first year or two; this will protect from hot winds, frost and vermin. Again I would say, do not plant more than you can find water for, as the consequence would be failure, and therefore disappointment.

Having thus in the first place tried to assure those living in less favored spots that a little fruit can be cultivated if only there is a cheerful willingness to comply with the conditions mapped out, now let me betake myself to spots eminently adapted for extensive fruit culture. Such sites are to be met with at the foot of many of our numerous hills, where there would be a reasonable drainage of moisture from the slopes above. Except for orange, lemon, cherry, and soft fruits, and for vegetables, I would not recommend the planting of the actual gully, but would make a start to plant at the commencement of the hill slope, and rise to a reasonable height with continuous planting. The first thing now to be done is the selection of the site, which must be sheltered as much as possible from the northern winds, and the soil must be loamy, with a clay subsoil and a fair admixture of gravel or loose stones. Next the fence must be erected, and this, I would emphasise, must be vermin-proof. Do not plant too many trees at first, only just so many as can be properly looked after until they are firmly established. Too many make a mistake here, and then give up greatly disappointed and condemn the whole thing entirely through their own folly. If I wanted to plant half an acre as a start I would first clear a piece of land 5 chains long by 1 chain deep of all timber, undergrowth, and large stones, and having fenced in—which fence may, if you choose, be sufficiently large at the first to continue further operations later on—I would then commence the work of sinking the holes for planting. Let this be done before the winter rains set in, so that the water can collect in the holes and help to soften the subsoil. A week or so before planting fill in your holes level with the surface, only casting aside any large stones met with in sinking. Then when planting time arrives (and I would say let it be early) do not plant too deep. Do not let the lateral roots be placed deeper than you would find them in the nursery, say from 3in. to 4in. below the surface—certainly not more. Let all bruised parts at the roots be cut away with a sharp knife before planting. Now as to the order of planting. I would put in a row of well-selected table vines at the base of the slope, and next would come mulberry, fig, or plum, at choice, or all if for experimental or fancy purposes. Then above would come apricots and peaches, and still higher, pears and apples. Round the outside of your planting you could put a row of almonds, which would act as a breakwind. I would strongly recommend that each person planting raise his own stocks from seedlings, or otherwise, and then use budding or grafting to get the true kinds; and, too, for northern planting I would strongly recommend that the young trees remain one year in the nursery after being worked before being planted out. I would most emphatically say plant only acclimatised trees, and never for the north import from southern nurseries. Having planted out whilst the tree is in its dormant state, let the head be pruned back so as not to call upon the roots in their new position to support too much wood. Do not be too hasty to have fruit. Let your tree be well established first, and see well to it for the first and second years that your tree has a good open head. Do not grow too much wood, but a little all round, and let it be strong. To this end I would strongly recommend summer thinning out. At the end of the fourth year your anxiety will be at an end, and you may look for a liberal reward for your past labor.

Mr. J. **Roberts** agreed that a few trees and vines might be grown by the farmers with profit, not so much in monetary gain as in comfort. On the west side of the range it was not the north wind they had to contend against, but the south wind, which was of a very blasting character. Lack of water had killed many trees in that neighborhood.

Mr. W. H. **Neal** said a neighbor who had a pepper tree attacked by termites, or "white ants," tried a solution of cyanide of potassium, which killed the insects without injury to the tree.

Mr. N. **Rogers** criticised the planting in a pit, which he said would kill the tree. He advocated the ploughing of the land to be planted to a depth of 12in. to 15in. No manure should be put into the holes, but on the top of the ground when necessary. He condemned the plan of planting trees and vines together in rows. In the north, where birds and everything else seemed to be at war with the farmers, the trees of a kind must be planted together. He deprecated coddling the trees, and said that if a tree would not live without all the nursing it would never pay for growing.

The **General Secretary** remarked that the paper was written for farmers in the worst parts of the dry north, and that Mr. Rogers had the advantage in his part of the country of a rich deep alluvium, and ample means for irrigation. Still he agreed that planting in holes, whether round or square, was altogether wrong. The whole soil should be broken up, else the flood waters, if any ever came, would fill the holes and drown the roots, and in dry weather the soil would shrink from the sides of the holes and the roots would be burned up, or they would fail to penetrate the adjacent soil, so that the trees would soon become practically root-bound.

Mr. J. **Cook** said that on two and a half chains he had grown in one year 15cwts of tomatoes and 5cwts. of cucumbers, and he felt certain that a few vines and a few trees could be grown with attention. He had never dug holes or used bones or manure. but simply broke up the land with a pick. He had made astonishing profits, and those who had seen his garden could testify that the trees were excellent. Windbreaks must be provided, especially against south winds: not so much to fear from north. One vine well looked after in a dry place is worth fifty neglected.

Mr. H. **Aldenhoven** urged farmers to take care of the storm waters and to turn them to a spot where a few trees could be planted.

Several others took part in the discussion, but nothing fresh was brought forward.

Sowing and Cultivation of Wheat.

Mr. J. **Smith** read a paper written by Mr. H. M. Borgas as follows:—

I am one of those unfortunates who have been trying to make farming pay in the dry Northern Areas, a task not easily accomplished, even from the best farming lands in the colony, and utterly impossible from our northern lands under the old style of cultivation. This truth forced itself upon me as I gathered my harvest year after year. The time has gone by when it was only necessary to follow the plough and harrows, and the work must now be done in a systematic and intelligent way. The nature of the soil has to be taken into consideration, and how to treat it, in order to ensure best results. This can only be ascertained by experimenting or watching the experiments of others. In the early days we were content to scatter the seed with our hands; then came the seed sower, and now the drill. In order to test the difference between broadcasting and drilling I purchased a drill, and last year measured off four plots of land and treated them in the following way:

No. 1—Broadcasted 45lbs. of seed to the acre.

No. 2—Drilled 30lbs. of seed to the acre.

No. 3—Drilled 30lbs. of seed to the acre with 60lbs. English superphosphate.

No. 4—Drilled 52lbs. of seed to the acre.

I watched the growth of the plant on these plots all through the year, and noticed that the drilled wheat kept ahead of the broadcast, and seemed a much healthier plant; but the real test came when I harvested the grain. I reaped every plot separately, cleaned, bagged, and weighed it, with the following result:—

No. 1—4bush. to the acre; cost of seed sown, 45lbs., at 2s. 3d. per bushel, 1s. 10½d.; return from 4bush., at 2s. 3d. per bushel, 9s.; deduct cost of seed sown, and there was a profit of 7s. 1½d. for labor, &c.

No. 2—Drilled 4$\frac{58}{60}$bush., at 2s. 3d. per bushel, 11s. 1½d.; cost of seed sown, 1s. 3d.; return for labor, 9s. 10½d.

No. 3—Drilled and manured, 60lbs. English superphosphate; gave 7bush., at 2s. 3d. per bushel, 15s. 9d.; cost of seed, 1s. 3d.; cost of manure, 2s. 6d.; return for labor, 12s.

No. 4—4$\frac{38}{60}$bush. at 2s. 3d. per bushel, 12s. 8d.; cost of seed sown, 2s. 2d.; return for labor, 10s. 6d.

From the broadcast there was 7s. 1½d. for labor; from the drilled, without manure, 9s. 10½d; from the drilled and manured, 12s.; from the plot No. 4, on which was drilled 52lbs. of seed to the acre, I got a return of 10s. 6d.

There was no guessing; the quantity of land in each plot was chained off; the seed sown was the variety known as Surprise; the plots were separated by leaving a strip of land uncultivated about 3ft. wide between them; the color of the soil grey, and of an ashy nature, which is a characteristic of most of the farming lands in the North. It is frequently said, "Give us sufficient rain and we will produce crops that will pay." Over the rain we have no control, but with our present rainfall we can increase our yield by finding out the nature of our soil and its requirements. It has been said that land that has been cultivated and allowed to spell for a few years, on being again fallowed becomes as good as virgin soil. This is not the case. Last fallowing season I had occasion to remove a fence dividing two paddocks. The strip of land where the fence was had never been cultivated: this I fallowed with the other. In October of 1899 several members of the Hawker Branch Agricultural Bureau visited my farm in order to inspect the plots I was experimenting on. To get to these plots we had to cross the strip of land where the division fence had been, and land that had not been cultivated for six years. I put this question to my visitors—"Do you think land that has not been cropped for six years on being again fallowed becomes as good as virgin soil?" They said, "Certainly." We were then close to the strip of virgin soil, and various opinions were advanced as to the cause of the difference in the growth of the plant. Some said it was manured; others said it was a different variety of wheat. I said, "The strip of land you have been commenting upon is virgin soil, and the land you are now on has not been cropped for six years." Had I reaped this strip of land by itself I am sure it would have yielded 3bush. more than the land that had not been cropped for six years. You cannot crop land without impoverishing it, and it is absolutely necessary to put back into the soil that which the plant robs it of, or something that will take its place.

The Wheat Yield of 1899-1900.

The above paper was followed at once by another written by Mr. J. McColl, of Richman's Creek Branch, as follows:—

I have pleasure in giving the results obtained from the different varieties of wheat grown by my brother and myself on our farm last year. With the two exceptions of Bartlett's Crossbred and Indian King, the varieties named had been experimented with or under cultivation on the farm for two years and upwards, the majority of them having been obtained in the first place in small quantities. Of course they are only a few of the best out of a number that were tried from time to time. We commenced seeding on the 27th of March with Red Straw on land that had been cropped once after fallow, and as the crop of 1898 had blighted a good deal for want of rain at the end of the season, the land was in good heart. The seed was sown broadcast and scarified in, then harrowed once. Between the 1st and 3rd of April, seventy-six points of rain fell, which brought up the seed already sown and that which went in for some three or four days after. The fallow was put in between the 11th and 27th of April, when the soil was fairly dry. It was sown broadcast, scarified in, then harrowed once; after that the cropping was completed on stubble land in the same manner as the first sown, seeding being finished on the 19th of May. From the 3rd of April to the 4th of May there was no rain, but on that date forty-one points were recorded, and between the 16th and 22nd of the same month sixty-two points. Those two light rains gave all the crop a fair start. The following is the rainfall as recorded on the farm for the twelve months ending December 31, 1899:—January, 0·07; February, 1·08; March, 1·16; April, 0·93; May, 1·03; June, 3·26; July, 0·85; August, 1·06; September, 1·63; October, 0·59; November, 0·56; December, 0.8; total, 12·30in., or, if the rainfall for the first three months to the end of March before any of the wheat was sown is deducted, 10in. I will now give the average yields from 150 acres of fallow: - Red Straw, 35 acres, 19bush.; Allora, 23 acres, 21bush.; Carmichael's Eclipse, 17 acres, 13½bush.; King's Solid Straw, 72 acres, 18bush.; Dart's Imperial, 2 acres, 17bush.; Baker's Early, 1¼ acres, 21bush.; Bartlett's Crossbred, 4lbs. sown, yield, 2¾bush.; Indian King, ½lb., yield, 30lbs., or an all-round average of rather better than 18 bush. The only other variety grown was the Twenty Weeks, but there was none sown on the fallow, but thirty acres sown on stubble early in May gave a return of 12bush. The Red Straw has been grown continuously on the farm for twenty years. In very dry seasons it does not do as well as some of the earlier varieties, but with the average rainfall it has always proved a success. Out of five varieties of wheat obtained from the Roseworthy College, in 1894, Allora was the only one which proved suitable after two or three years' testing, and we find it one of the best to withstand the dry seasons; last year it was about the least affected of any by frost or hot winds. Carmichael's Eclipse is an early wheat, and has been tried for three years, but not proving a success will not be sown again. King's Solid Straw, second year, one bag sown in 1898 returned nineteen bags, or 15bush. per acre, and last year the crop, which was very promising in September, suffered to a certain extent from frosts and hot winds, patches being blighted. Dart's Imperial, third year, stools well, but rather late in ripening; still, considering the season, the return was good. Baker's Early, third year, good grain; has proved the earliest of all the wheat tried and yields well. Bartlett's Crossbread, first year, is early; grew rather tall, and was severely blighted with hot winds about the middle of October. Indian King is early; good ears and fair grain, but rather flinty. Now, as to the yield on stubble land. The early sown gave a return of 11bush., while the wheat sown after the fallow averaged 10½bush.; total average, including fallow, 14bush. Now, in conclusion, may I anticipate a question that may arise—How do you account for the yield being so much above the general average of the district? I do not pretend to be able to do so fully. Some people tell us, "Oh, you are in a picked spot, and the land is good." Admitting that there is a little in that, still we do not monopolise all the picked spots or the good land either. There are other places equally as good, and probably better; but what I wish principally to point out and to emphasise is the value of early fallowing with after cultivation to conserve the moisture. Professor Lowrie has again and again tried to impress upon farmers the importance of early fallowing, so that as much as possible of the winter rains might be conserved in the soil for the benefit of the following crop. I believe this will partly account for the increased yield on our fallow last year. The land was ploughed up in July and August of 1898; during the latter month of that year the rainfall was over 4in.; the land was harrowed as soon as the fallowing was finished, and before haytime it was scarified. I know it has been a matter of extreme difficulty with many farmers to fallow early during the last few years from scarcity of feed for working stock. Another matter of importance is the choice of seed and when to sow, such as sowing the later varieties early in the season, and the early ones later; in doing this there will be less risk of harm from the frost.

Professor **Lowrie** complimented the writers of the two papers on the evident care they took with their farms. He mentioned that he felt that it was in that neighborhood a mistake to sow the seed too thinly. In favorable localities good crops might be secured by thin sowing, but the practice was too prevalent in districts unsuitable.

Mr. W. J. **Gleeson** (Carrieton) said that where farmers sowed thinly they would get the best results on clean land, and where the rainfall was scanty the thinner the sowing the better the results.

Mr. **Aldenhoven** said much of the land which had never had a cultivating implement put upon it could not properly be called "virgin soil," because live stock had been reared upon it year after year for half a century and more, and sent off the land; consequently they carried away in their bones, hair, wool, and flesh large quantities of phosphoric acid, potash, nitrogen, and other materials which are necessary to plant growth.

The **Chairman** said time would not permit of an extended discussion upon this important subject, as there were so many papers, &c., upon the agenda. He therefore called upon Mr. George Jeffrey, lecturer on "Wool" for the

School of Mines and Industries, who give an address on "Wool, and the Care of Sheepskins," to the same effect as that given at Gladstone Conference.

Mr. HUTCHENS asked if it would pay to scour wool before sending it to market.

Mr. JEFFREY: Not as a rule. It might pay on large stations at considerable distance from market, where cost of carriage is an item to be considered, and then there must be a large supply of water. Neither did it pay a small farmer to send his wool to a woolscourer. It is better to leave the scouring to the purchasers. [A member here said that a farmer considered he cleared a profit of 2d. per pound on his wool through having it scoured.] Mr. Jeffrey was dubious as to that. In regard to classing, the farmer could do it more easily, better, and more cheaply.

Alleged Inferior Bluestone.

Mr. S. IRVINE, for the Hawker Branch, initiated a discussion upon the desirableness of preventing the sale of adulterated sulphate of copper (commonly called "bluestone"), and mentioned that a great many crops had been seriously damaged this last season through the prevalence of bunt or "stinking smut."

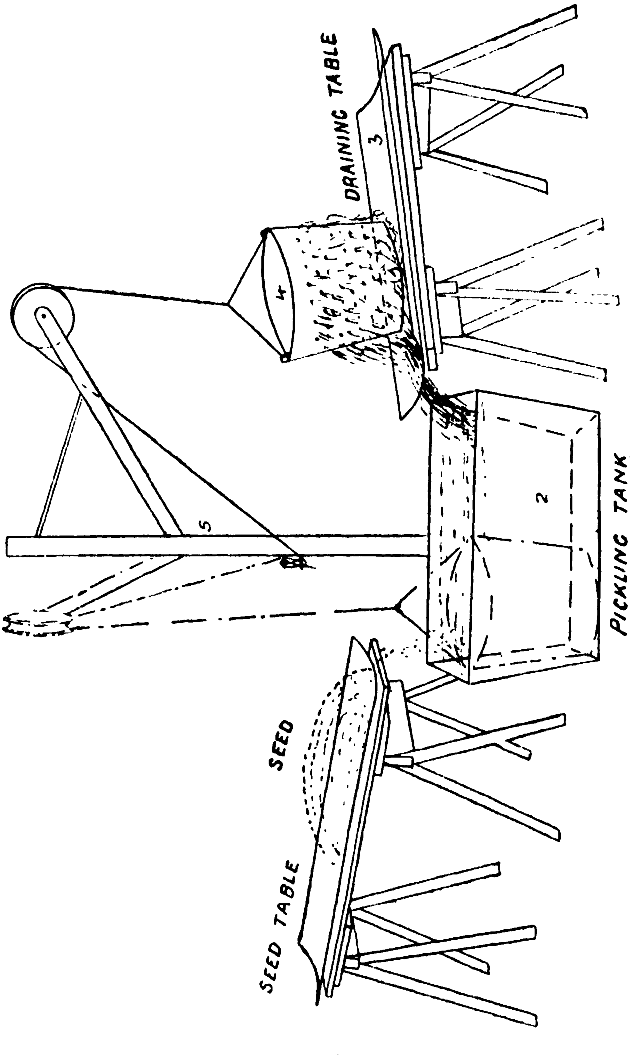
The GENERAL SECRETARY said he thought a great deal of talk might be saved, as the Central Bureau had sent out to all centres asking for samples of their bluestone for the purpose of analysis. Several samples had already been received, and he was sure none of them were anything else than pure bluestone. Still they would all be analysed to make assurance doubly sure. Similar complaints as to supposed impurity of bluestone had been made in Victoria, but quite a large number of samples had been procured and analysed, with the result that all were found to be pure.

Professor LOWRIE doubted if there was much adulterated bluestone sold. There had undoubtedly been great losses this season through the prevalence of bunt, but he attributed most, if not all of it, to errors in pickling the seed, and to the presence of bunt balls in the seed wheat, which became broken by the force-feed of the seed drills, thus reinfecting the seed.

Mr. IRVINE said when he used to pickle on the floor, using a shovel to turn the seed, the steel blade of the shovel become coated with a film of copper. Last season, when pickling, he dipped the seed, using perforated kerosene tins, but they were not eaten away or affected, except that they turned of a rusty color.

Professor LOWRIE explained how and why one ear only in a plant, or even portion of an ear, of wheat becomes bunted, whilst the rest produces sound grain. For pickling, if he can see bunt amongst the seed, he uses 2lbs. bluestone to 15galls. water; but ordinarily he would use 1lb. to 10galls. Four bushels of seed would take about 2galls. of solution to cover every seed with a thin film of the pickle. In answer to a question whether the pickle remaining after a bag of wheat has been dipped in it is weakened, he said, "No; the remainder of the solution is as strong as the whole was before the wheat was dipped in it. If any crystals had been left in the bottom undissolved, the pickle might be stronger, but not weaker."

The GENERAL SECRETARY described an idea of his own for pickling wheat. He would have two small inclined platforms, with a tank for solution between them. There should be a derrick and whip, with perforated copper basket—or other receptacle—to be immersed in the pickle; the seed should be dropped over the edge of the platform into the basket, when all bunt balls and rubbish would float to the surface and be skimmed off. The basket of seed would then be lifted by the aid of the derrick on to the other platform and left to drain, whilst another similar basket was being used for pickling another lot of seed. By this method it would be ensured that each grain of seed was properly pickled, and a deal of oats, barley, bunt, and other rubbish would be removed.



1. Seed Table; 2. Pickle Tank; 3. Draining Table; 4. Basket for Seed; 5. Derrick.

Sheep, Poultry, and Pigs on the Farm.

Mr. A. McDonald, of Davenport Branch, read the following paper:—

It is now generally acknowledged that wheat-growing as a profitable industry of the present day is very different to what it was twenty or thirty years ago, climatic conditions and the low prices ruling being the primary causes. The wholesale destruction of the forest trees has also largely contributed to the scanty rainfall of late years. To overcome this evil I would suggest that the farmers should go in as largely as possible for tree-planting. Thousands of trees are available yearly for this purpose free of charge from the Forest Department. Moreover, tree-planting would prove beneficial in many ways. For instance, timber for all purposes within a short time will become scarce and expensive. Belts could be planted on the farm in convenient positions, which would give a more homely and attractive appearance to the holding.

Shelter would be provided for the stock, and breaks against the cutting north and south winds. To make wheat-growing a more profitable industry the farmer must turn his attention to other sources, and I would suggest a combination of sheep, poultry, and pigs for the farm. With proper management there is nothing that would pay better. It would be necessary to exercise great care and judgment in selecting the different breeds in the various classes for this purpose.

Opinions will differ as to the best breed of sheep for utility. In New Zealand the Leicester-Merino cross is considered the best to give meat and quality, but considering the difference of climate and grasses, I should favor the Shropshire-Merino cross, and would select a large-framed well woolled Merino ewe to mate with the Shropshire ram, and should get them as pure as possible. To commence with this cross you would get large hardy early maturing lambs, and with the export trade and increasing local demand for lambs and sheep of high-class quality, satisfactory prices could always be obtained if sent to auction in tip-top condition. The land would also be manured and kept clean, a heavy butcher's bill avoided, and the annual clip of wool, the fat, and the skins would bring in ready cash. Special care should be taken of the skins. These command high prices if sent to auction in perfect condition. In all cases they should be kept out of the weather, and should be kept as clean as possible, both on the wool and flesh sides. Where practicable, stretching is the best, but I find a very good plan is to hang them up in the shed on a rail as soon as possible after they are taken off the sheep. Leave the trotters on, pull tight, and drive a nail at the extreme ends of the neck and tail. This will keep them in position, and when thoroughly dry they will have a splendid appearance. I should always strongly advise the use of the weevil wash, a cheap preparation to be obtained from any of the salesmen. Hides should also be treated in a similar manner, kept as clean as possible, carefully flayed, cuts and scoring avoided in taking them off. Spread out in the shed and use coarse salt freely. They should then be allowed to remain until the salt has taken effect, then roll up tightly and send to auction. If treated in this manner the very highest prices will be realised. Dirty, cut and scored hides receive but little attention at auction, consequently low prices have to be taken for them. It has been estimated that an annual loss is accruing in Australia of £102,453 on the sheepskins and £54,000 on the hides through carelessness and the undue use of the knife. These figures have been carefully prepared, and show a most grievous and preventable loss The holding should not be less than 1,000 acres, and the farmer should make quality his study. It will not pay to keep inferior animals in this particular class. Overstocking by all means must be carefully avoided, otherwise failure will be the ultimate result. On smaller holdings sheep would have to be dropped and poultry and pigs only taken up.

Poultry.—This industry has a great future before it, especially when we take into consideration that England's importation alone amounts annually to something over £5,000,000 for poultry and eggs. South Australia could easily supply a large part of this. Eggs have already been exported with great success, both financially and otherwise. New South Wales is doing a large and profitable business in this line, and 50,000 head of poultry were disposed of during the past two years, valued at £6,250. As a further illustration, I would draw special attention to the enormous value of the American poultry industry. Last year's output of nearly £60,000,000 was of greater value than the wheat crop, and worth twice as much as their sheep. These figures should surely impress our farmers and producers with the very important part the poultry industry should play in this colony. [Mr. McDonald here gave a lengthy description of table varieties of poultry, their crosses, feeding, houses, enormous extent and value of the poultry and egg business in England, Russia, Italy, America, &c., subjects which have quite recently been dealt with in the *Journal of Agriculture* by Mr. D. F. Laurie. —GEN. SEC.]

Pig-keeping.—The pig being an essential animal for the farm, we must therefore consider the best sort to give the highest results. A decided preference obtains for the Berkshire. The only objection, from a bacon-curer's point of view, is its color. Black pigs do not make as saleable sides of bacon as white ones. However, as the Berkshire is the most productive as regards its yield of bacon, giving for its weight far less offal than any other pig, we cannot discard it. Crossed with the Yorkshire, a profitable class of pigs could be grown—in fact, just what is wanted. The public now-a-days will not eat over fat bacon. Pigs, if a dead weight from 80lbs. to 150lbs., would suit all tastes. The farmer would do better to dispose of his pigs to the factories, or send them for export. With the modern appliances and methods the factory-cured bacon has a decided advantage over the farm-cured, both in quality and appearance, consequently the farmer has to accept about 2d. per pound less from the storekeeper The chief thing in the management of a boar to get good results is to give plenty of exercise. Keep him in a vigorous condition, and not loaded with fat. He will then be more sure, and his litters larger and more vigorous than would be the case if he were kept shut up in a small pen. For breeding I would choose a long rangy sow with not less than twelve teats, and they should start as near the foreleg as possible. By observing this, a large litter would have more room to suck, each having a better chance to get its share of the milk. It is even more important that the sow should have exercise than the boar. It is often fatal to both sow and pigs to have her shut in a small pen while carrying her young. She should be fed on swill for about a week before she is expected to farrow. Let her bury herself in a pile of straw and let her alone for a time. Having a warm comfortable bed, she will be more quiet and contented, and you will get better results. After a day or two give her all the food that she will eat, with plenty to drink all the time. There is no time that young pigs can be grown so cheaply as when they are on the sow. If shut up they should have a good supply of ashes, with a little sulphur and salt now and then, and they should also have a good clean, dry place to sleep in. The young boars should be castrated when a month old, as at that time they are not set back. They can be easily weaned if there is a supply of milk, but if not, a swill of bran shorts and a little crushed oats will bring them along all right. There is nothing better to grow young pigs on than oats with a little wheat now and then, which is the cheapest food to be had just at present; but the best results attendant upon feeding are secured by the use of barley meal, separated milk, and potatoes. A combination of these foods has been found to make the finest quality of pork, and it would appear that no feeding stuff will pay the farmer better. Crops that would not pay to reap for milling purposes could always be fed profitably to pigs and poultry.

Mr. **Dunn** (Johnsburg) said sheepskins should be laid across a perfectly straight rail, else they would dry crooked. Hides should have the edges folded until they meet, then fold again and roll up from the end.

Mr. W. B. **Rowe** said 1,000 acres in the Far North is not sufficient to maintain the number and variety of animals mentioned. The farmer ought to have 5,000 acres On such small farms when sheep are kept the horses and cattle are poor. Poultry should roost in trees, where there is abundance of fresh air, and where the ticks are not so liable to attack them.

In answer to Mr. C. Pearce, Professor **Lowrie** said the best time to send pigs to London is when the weather there is not hot. Porkers should not weigh more than 85lbs.

Farming in the North.

Professor **Lowrie** gave an address on this subject. He thought that in a district handicapped by drought, where to a lesser degree labor rather than skill produced results, and where rainfall largely determined the yield, it was wise to try to get a large holding of land, and by large holding he meant 4,000 or 5,000 acres. On a property of this size one could keep a few sheep without great expense, and he could also keep other kinds of stock, such as a herd of pigs, and, if his tastes laid in that direction, even dairy cattle. He believed that in time a class of yeomanry would rise, who with big holdings would change the character of farming in the North. These farmers would have big holdings, with a big area under cultivation, and when a good year was experienced enough profit would be made to make up for a number of years of drought. He looked at the point on the ground that the holdings should be much larger, relatively speaking, than they were at the present. Cultivation should not be so thorough as in more favored districts. He knew he was in dangerous ground in speaking in that manner, and did not mean to infer that farms should not be kept clean, that stock should not be of the best, and that work should not be thorough; but what would be thorough for the North would not be thorough for the more favored districts in the South. There would be, under his idea of the best method of farming in the North, large holdings of land, to be fallowed with judgment. The ferments at work in the soil required moisture and air. If the lands were opened early in the season and cultivated later the means were given for the ferments to do their best work, eating up organic remains and bringing them into condition for the next crop. They could not lift the land early enough in the season, and they could not leave it alone enough at the present. The summer working was a real danger in the colony. He said work it in the winter, while the land was mellow, but let it alone in the summer. After dealing with the characteristics of several wheats, he said that he thought that for the North the best class of wheat was an early variety which did not grow too much straw. He had at one time expressed the opinion that it would not pay to use artificial manures in the district, but experience of the recent dry seasons had made him modify his views, as he felt that it was possible to use soluble artificial manures with profit. It had recently been proved that soluble phosphatic manures applied to plants rendered less moisture necessary for their cultivation. This was a most important discovery for the farmers in the Far North.

There was a very short discussion, and not much of importance was brought out.

Dairying.

Mr. G. S. Thomson, Government Dairy Expert, gave an address on this subject. He said—It would be madness to advocate dairy farming throughout the North, but in certain stretches of country cows could be kept with satisfactory results. After impressing on the assemblage the necessity of choosing animals of good strain for forming a herd, Mr. Thomson addressed himself to enumeration of the points to be watched in the manufacture of butter. The cause of the low price of South Australian butter was the presence in it of large quantities of butter-milk. Sufficient care was not taken to get this butter-milk out of the butter, and consequently large numbers of cases sent to the depôt for shipment had to be branded "pastry." It was impossible, he knew, to get rid of the butter-milk in the hot weather often experienced in the North. If they kept cows for the purpose of milk-selling, they would probably do best to keep milking short-horns; if they desired to make butter only, the Jersey strain would be kept; while the Ayrshires would have to be kept if they went in for cheese-making. A lot of poor butter was sent from the northern districts to the depôt for shipment, but from Wilmington (Mr. Tuckwell's factory) the best all-round shipments of butter that had reached the depôt had been sent. Farmers should send their milk or cream away as often as possible, and should pay the greatest attention to the cleanliness of the implements used.

Tomato Disease.

Mr. G. A. F. Altmann read the following paper:—

It is frequently noticed that just before tomatoes are ripening (or if a plant is badly affected it will not flower or set fruit) some of the bushes show strong greenish flowers, green tomatoes show signs of cracking, and the bush is no good any more, the best thing to do is to pull it up. Over-watering is sometimes blamed for this trouble, but I doubt whether too much or too little water has anything to do with it, as in a number of plants treated exactly the same way a few here and there only are affected, while the others bear fruit until the end of the season. I bought different varieties of seed last year. One variety was a total failure in not setting fruit; one was very badly affected, while the others seem all right at the present time, and have been bearing and setting fruit. Some may say it is through not changing the seed, or growing tomatoes on the same place year after year. If so, how is it that there are places where no tomatoes have been growing before, and yet the plants are attacked with the same disease; even here, in some of the Quorn gardens, where only the very best of seeds were sown? Others may say, "Why, that is nothing new; it has been known for years," and there are always some plants troubled with the disease. Quite right; but if a grower sees about two-thirds of his plants affected, the same as I had a few years ago out of a packet of seeds purchased from a reliable seedsman, he would not say so. Now, I myself, little as I know about tomato-growing, do believe the whole trouble is through sowing inferior seeds. Some seeds will produce a good plant, while the others—do whatever you like in watering, cultivating, &c.—will turn out a bad plant, something similar to smut in wheat. The same with the tomato (except if a plant is badly affected it will neither flower nor set fruit). Now, there is another trouble which I have noticed these last two or three years, even down as far as Gawler, in tomato-growing. When tomatoes are beginning to get ripe some bushes seem to dry off quicker than they ought to, even if they have plenty of moisture. Sometimes hot winds have a lot to do with it, also dust storms; but what I have noticed lately it seems as if it is starting out of the ground and spreading on the plant, which causes the leaves to dry up more quickly than they ought to, thus leaving the fruit bare. Now the Gen. Secretary's remarks on part of this paper on August 19, 1899, read thus:—"The description of the trouble is not too clear. Over-watering or over-manuring will frequently cause the failure of the flowers to set fruit. The flowers turning green is probably due to the seed running out, owing to too much in-breeding."

Mr. Altmann then exhibited plants illustrative of his remarks.

Standard Sample of Wheat.

Professor W. Lowrie directed attention to the sample of 1899-1900 wheat sent out by the corn trade section of the Chamber of Commerce, and practically repeated what is reported on the same subject at the Gladstone Conference on February 14. He was unanimously supported by many other speakers, and the following resolutions were adopted:—"That we, as a conference of farmers, think that the time has arrived for an inquiry whether it is practicable to fix a constant standard for wheat, to be graded as Nos. 1 and 2." "That it be a request to the Central Agricultural Bureau to move for a representative meeting of farmers, millers, and wheatbuyers to decide whether the proposed change should be made, and to fix the constant standard if the proposition is approved."

Rabbit Destruction.

Mr. J. Dunn, for Johnburgh Branch, read the following paper:—

In dealing with this question I feel that I have taken up one of the most important questions of the day—one in which we, as occupiers of the soil, whether as farmers or graziers, are much interested; in fact, it is a question affecting to a greater or lesser degree, either directly or indirectly, all sections of the community. Droughts and the locust pest are troubles over which we have no control, but the rabbit pest, although quite as ruinous as either of the others if allowed to go unchecked, can, if proper means are adopted, be so far kept under as to do little or no damage. My only object in writing this paper is to give those assembled at this Conference and the public at large the benefit of my experience in the destruction of rabbits, and to briefly describe the methods that I have found to be most effective, as follows:—When rabbits are numerous, especially in summer, nothing beats wholesale poisoning, either by strychnine and sandalwood twigs, arsenic and sandalwood twigs, phosphorised pollard, or arsenicated wheat. Toxa is a good, safe, and effective poison, and will be eaten by rabbits while wheat and grass is green. I have had good results from its use, but it is more costly than other kinds of poison. A good deal of difference of opinion exists as to where and when to lay the poison. My experience is that it does not matter much when it is laid, but where is most important. I have always found that the buck-heaps are the best places, first clearing a place 1ft. square, so that the bait will not get easily covered by the droppings, and the freshly-disturbed surface attracts the attention of the rabbits, and they are more likely to get the poison. If the pests are so numerous as to be likely to quickly eat up all the bait laid, for two reason I prefer strychnine and twigs. First, it is the most humane poison of the lot, as it kills instantly and on the spot; it inflicts no unnecessary pain, and there is no fear of your neighbour getting credit for work done by yourself, and, secondly, it is very quickly and easily laid. But when rabbits become scarce, and to get the few odd ones, I prefer arsenicated wheat or phosphorised pollard, as it will remain good for weeks, or even months, during dry weather; I give the former the preference. After as much as appears possible has been done by poisoning, the next and most important step is to thoroughly destroy burrows and all harbor, and unless burrows are thoroughly destroyed, it is almost impossible to get rid of all the rabbits; but when they have no shelter dogs will soon catch up the few that escape this poison, and this should be continually attended to through the winter and early spring, to prevent an old doe from nesting and forming new colonies of rabbits by successive and numerous litters of young. This is more particularly necessary in those numerous belts of soft white land that run through so much of our northern country, where rabbits find it so easy to burrow, and so dry, warm, and comfortable to live and breed in. Now as to the best, easiest, and most effective way of destroying burrows. When they are shallow I prefer digging them clean out, but when they run deep I dig down the entrance until it runs 1ft. or more deep; I then place a good handful of poisoned sandalwood twigs an arm's length into the burrow, and tightly fill the outer part with dry sticks or saltbush well rammed in, and fill the trench above the level of the surrounding ground with loose earth. Another good plan for large and troublesome sets is to cover them to a depth of 5in. or 6in. with rotten wheat chaff or sheep manure; but I believe the best plan of all, where it can be done, is to plough drains so as to conduct flood waters into them—this is a complete cure. In conclusion, the fact must not be overlooked that no system, no matter how good in itself, will be effective unless all work simultaneously and keep at it until the pest is completely eradicated, which from past experience I have no hesitation in saying may be easily done. Although I do not lay claim to a monopoly of knowledge for the preparing and mixing of the various poisons commonly used for the destruction of rabbits, I willingly make known my methods, with the hope that such may be of some use to at least some of those who are battling with the pest. For strychnine—Dissolve 3lbs. or 4lbs. sugar in 2galls. water; add 2lbs. flour made into a nice smooth paste; dissolve 1oz. pure strychnine by boiling in ½pt. of good vinegar, and mix all well together. Dip twigs into this and lay, and rabbits will die on the spot. Arsenic and sandalwood—Moisten twigs with water, sprinkle with fine sugar, then sprinkle with arsenic until fairly white, and lay. Arsenic and wheat are done same as above. Phosphorised pollard—Dissolve 4lbs. sugar in 2qts. boiling water in small tub; dissolve 1½ sticks phosphorus in 1qt. boiling water in an earthenware vessel; mix and stir constantly; mix in sufficient pollard to make a stiff dough; make into small pellets, either by hand or by using a pellet-making machine, obtainable at a cost of £1 from leading ironmongers. Caution—There is some danger of fire from the use of phosphorus unless it is thoroughly dissolved and thoroughly mixed by being constantly stirred until the dough is properly made. Supplies of this poison must always be kept covered with water, and should be stored in some underground place where there is no possible danger of fire should the phosphorus ignite, which it will do immediately it becomes dry.

Docking Wheat Bags.

Mr. J. Smith, Hawker Branch, began a discussion on this subject, but there was not time to do it justice, or for others to speak upon the question, so it was allowed to drop.

Next Conference.

It was resolved that it it is desirable to hold another Conference at Quorn at about this time next year.

Thanks.

A comprehensive vote of thanks was accorded to all persons who had in any way contributed to the great success of the present Conference, especially to Mr. A. Noll, the convener.

NORTHERN YORKE'S PENINSULA BRANCHES.

A Conference of Northern Yorke's Peninsula Branches was held at Bute on February 21, 1900. Convener, Mr. R. W. Bawden, of Port Broughton. Present—From Central Bureau: J. Miller, M.P., and A. Molineux, Gen. Sec. Bute: W. H. Sharman, A. Schroeter, H. Schroeter, D. Green, J. H. Barnes, W. Langland, S. Lamshed, and M. Hall. Port Broughton: R. W. Bawden and E. Dennis. Arthurton: W. H. Hawke and T. B. Wicks. Kadina: S. Roberts, D. Kennedy, and H. Johnson. Pine Forest: R. Barr, jun., W. H. Jettner, and A. Mudge. Brinkworth: A. L. McEwin and G. Freebairn. Koolunga: J. Sando and W. J. José. Mundoora: T. Watt. There were also several visitors, including Mr. W. P. Cummins, M.P.

Exhibits.—By S. Roberts, Kadina—Two apples, supposed to be Australian Beauty, very fine; tree heavily loaded with fruit, all others bore very light crops. By G. Phillis—Californian Purple Straw wheat, a remarkably fine plump grain, prolific. By Mr. Button, of Koolunga Branch—Eighteen samples of wheat grain, including Alpha, Beta, Delta, Gamma, Omega, Budds, Dart's Imperial, Golden Return, Early Straw, Baroota Wonder, Early Para, King's Bearded, Klub's, Red Straw, Purple Straw, Freeman Hybrid, Petatz Surprise, and Riverina. By members of Brinkworth Branch: C. Ottens—Purple Straw, manured, yield 16bush. per acre, weight 63½lbs. per bushel; Steinwedel, not manured, 9bush., weight 66lbs. per bushel; Early Para, manured, 12bush. per acre, weight 66lbs.; Petatz Surprise, weighing 67lbs. per bushel. H. J. Welke—Purple Straw, manured, 65lbs. J. Graham—Smart's Early, 12bush. per acre, 67lbs. per bushel; Purple Straw, 16bush. per acre, 65½lbs. H. Wundke—Purple Straw, on fallow, manured, 6bush. per acre, 65½lbs.; Steinwedel, unmanured, 4bush. per acre. J. Everett—Bearded, bonedusted, 14bush. per acre; Petatz Surprise; Purple Straw, unmanured. A. L. McEwin—Purple Straw, manured, 16bush. per acre, 65lbs.; Bearded, not manured, 5bush. per acre; Petatz, 14½bush. per acre, 66½lbs. W. H. Shephard—Marshall's No. 3 Purple Straw and Dart's Imperial. G. Freebairn—Petatz Surprise, 66½lbs per bushel; and Red Straw. By Mr. J. Jones, teacher of public school at Bute—A considerable number of wheats in the straw, cultivated experimentally, with and without manures, by the pupils, under his superintendence.

Mr. R. W. **Bawden**, Port Broughton, took the chair and welcomed the members present. Members of several Branches were unavoidably absent through having to attend at the Local Court, which was being held that day.

"Farmers on Strike."

Mr. E. **Dennis**, Port Broughton Branch, read a paper to the following effect:—

He had frequently heard, both in England and Australia, that farmers are the most grumbling, dissatisfied people under the sun, but his own experience did not bear out the charge. No other class of people is so dependent upon the weather as the farmers, and they have to work out of doors in all sorts of weather—hot, cold, wet, dry, pleasant, or unpleasant. Then lawyers, doctors, and professional men have their scales of minimum charges for any work they do, and "stick it on pretty hot above the scale if they get a good mark." Merchants, mine owners, manufacturers, &c., can reduce the number of employés or lower their pay if they are not satisfied with the profits made, or they can lock them out until the manufactured goods fetch better prices, whilst the workmen may strike work if they are not satisfied with their wages. But the farmer has no voice in fixing the prices of his produce, nor in fixing the weight of the standard average bushel of wheat for the season. [He then gave his ideas as to how the corn-trade section of the Chamber of Commerce made up the f.a.q. sample, and as to how it ought to have been done.] The farmer lays his land up in fallow one year, waits till the next before he sows his seed, and then has to wait a long time before he knows whether he will get a crop, or a single penny for all his work and all his waiting. He does not know what he will get per bushel for his crop until the merchant fixes the price for him, and even then he may be "docked" 2d. to 6d. per bushel because it may be asserted that his wheat weighs under the "standard," or has a little bunt in it. Even though it costs him 5s. per bushel to produce he must accept 2s. 6d. per bushel if the merchants have fixed the price at that. The farmer's wife may take her 3lbs. of butter for sale to the store, and must accept the offer of, perhaps, 6d. or 8d. per lb., notwithstanding that it is the whole product from two cows for three days, which have been milked twice a day, and that it took five or six hours of her time to churn. A shilling per pound would not pay for the labor, but she has to take what is offered. The farmer tries to make up for last season's deficiencies by cropping more land, purchasing manures, getting into debt, and if he should be fortunate enough to get a decent crop he stores it with the merchant, who uses the wheat to make up a cargo of 20,000 or 30,000 bags instead of buying what is deficient from other farmers at an advance of perhaps 2d. or 3d. per bushel. Should the farmer want his wheat back, he is obliged to accept some of similar quality from Port Adelaide, Port Pirie, or wherever the merchant may fix upon. If the farmer were to store his grain in his own barn he might be able to sell it at 2d. to 3d. per bushel better price than the merchant gives him, besides getting the benefit of the extra weight acquired during the dampness of winter. "The farmers are a contented, patient, long-suffering, and liberal class of people, who do not 'strike' to better their position."

Mr. J. **Miller** said farmers would get much more satisfactory results by joining the Farmers' Union than by storing in their own barns. It would happen that, when they wanted to sell, the roads would be too heavy, or the teams were required on the farm to work the fallow or get in seed, or do other urgent work. All profits made were divided amongst the members. With regard to samples, he had taken wheat to three different buyers, each of whom tested the weight per bushel by means of the small measure, and all three differed.

Mr. E. McEwin agreed that it would cost the farmer from 1d. to 2d. per bushel to store wheat in his own barn—what with carting it in, loading it out, and other items. If roads were bad at the time of carting off the farm there would be more expense and labor.

No fresh ideas were brought out in the rest of the discussion.

Field Trials.

Mr. R. W. **Bawden** had written a paper upon "Field Trials of Agricultural Implements," which was read by the **General Secreary**, as follows:—

There is nothing, in my opinion, better calculated to improve and bring agricultural implements to perfection than field trials. The Northern Yorke's Peninsula Field Trial Society has done more than all the other agricultural societies to improve and perfect such implements. A number of leading agricultural show societies have lately ceased to offer prizes for agricultural implements because their merits cannot be properly estimated until they have been practically tested at work. No man can tell by merely looking at an implement in the show yard what its merits and capabilities are, but in a field trial it is almost impossible for competent judges to fail in arriving at a correct decision as to the respective merits or demerits of the competing implements. How often do we see implements judged in show yards by the repute of the makers; but in the field trials each implement is judged by its performance, and must stand or fall by the test it is submitted to. Field trials, again, are far more educational than are shows, inasmuch as every manufacturer will be shown wherein his implement is weak or fails to do satisfactory work, and he is placed in a good position to endeavor to remedy its defects. Field trials also afford an object lesson to the farmers attending them, as they can see exactly by the judges' cards how the decisions have been arrived at. It is most desirable that about four strong field trial societies should be formed in as many different agricultural centres of the colony. The trials should always take place near a railway line, so as to afford ready means for everyone interested to attend. At the proper time one year there should be a trial of implements connected with preparing and seeding the land, and the next year the trials should be connected with the harvesting and preparing the crops for market. The Northern Yorke's Peninsula Field Trial Society propose to hold a trial of implements, &c., connected with seeding operations, at Bute, in August next, and will probably have a trial of harvesting implements at Paskeville during the following year. At the latter place the society has procured a block of land for the purposes just indicated.

Mr. A. L. **McEwin** said the Brinkworth Branch arranged for a trial of sowing machines, drills, &c., but only two competitors appeared on the field. In judging the machines it would be necessary to have competent men, as the conditions under which they were worked would affect the work done. The trials should always be conducted near to a township and not far from a railway station, so that the fields could be frequently visited by farmers to see how the crops get on.

Mr. J. **Miller**, M.P., said perhaps the failure at Brinkworth was because it was of too local a character. If Mr. Bawden's suggestion that four centres for field trials were adopted, it would be possible to offer greater inducements (in the shape of good prizes and extensive publicity) for competition. At the small shows and trials the prizes were insignificant, the competition too limited, and the judges often incompetent, so that practically there was no proper trial. August was altogether too late for a trial of seed-sowing implements, but ploughs and cultivating implements could be tried. The exhibition of seed-sowing implements at the Royal Agricultural Society's Exhibition last September, and judged by Professor Lowrie, was most instructive. The seed and manures were delivered by the drills into bags, so that the quantities of each could be measured and weighed. Of course, this plan would not show irregularities in the distribution, but only the amounts sown during a certain period of working.

Messrs. **Johnson** and **Kennedy** (Kadina), were strongly of opinion that the judges should be appointed by a committee, and that a trial in the field was necessary to determine whether or not the seed and manure is distributed evenly. The crops should be inspected frequently after they were started.

Several members stated that most of the seed-drills distributed seed and manures in patches, missing spaces of a foot and more, and that judging the merits of the machines by catching the seed and manure in bags is not reliable, since it does not show that the sowing is *regular*. Another fault in many machines is that of sowing a full stream of seed and manure at one end and very little at the other. They thought that the judgment should not be given until about a month after the crop is up. Implement makers and importers decidedly object to exhibit and compete at so many shows—sometimes as many as six being held in one day in various parts of the colony. There was a necessity for reform in this matter.

Co-operative Threshing Plant for Districts.

Mr. R. Barr, jun., Pine Forest, read the following paper:—

The practice of cutting and binding the wheat crop is not in much favor in this locality, and I am no advocate for the exclusive use of the binder, the stripper being the proper machine for dealing with light crops on our scrub lands; and, as light crops are the rule unfortunately, I have no intention of disparaging the Australian implement. With the improved methods of seeding, embracing the use of good cultivators, seed and manure drills, fallows, and commercial fertilisers, we may reasonably expect heavier crops in the future, and the question of saving straw in times of plenty is readily acknowledged as worthy of farmers' best attention. Machinery capable of dealing economically with a portion of each farmer's wheat crop cut in the dough state is altogether too expensive an item for the invividual grower, and if a scheme to act in concert could be decided upon, it would be a work of real practical value. After careful comparisons of the cost and utility of horse, steam, and oil as the motive power, I am in favor of the latter, at the same time admitting that the question of steam *v.* oil is by no means settled where firewood is abundant, and the water, we may reasonably expect, will soon be ditto. Although as regards water, about the same quantity is required for cooling with the oil engine as is needed far making steam. The cost of an eight horsepower oil engine (portable), a thresher, capable of dealing with say 30bush. of wheat per hour, and from 40 to 45bush. of oats, with a large-sized chaffcutter, of 3 tons per hour capacity, which I advocate for inclusion as a valuable adjunct to a travelling plant, would amount with all etceteras to about £500—an impossible sum for the average farmer, but within measurable distance of attainment when contemplated by a number of farmers; fifty at £10 each, or twenty-five at £20 each, would start the concern, and the after results would depend on ourselves, and the greater the use made of it by the individual shareholder the greater benefit he would receive in the shape of fodder. Farmers combining for this object would have to decide, each one for himself, according to circumstances, what proportion of his crop to cut, but from a third to a half of the total area in crop could generally be cut and threshed. I may state that my practice for the past seven or eight years has been to so treat one-third of my crop, and although a small thresher, worked by two horses, such as I use, is a slow means of dealing with it, and the whole business makes a longer harvest, it is better than to leave it all for the stripper. The matter of getting a fairly good crop cut down, sheaved, and stacked out of the way of storms is no little relief, as I have frequently found, and I do not hesitate to assert that a loss equal to the whole of the extra cost of handling is often made by leaving a heavy crop till it is dead ripe. Some of you know all about having two or three bushels per acre shook out of a hundred acre block of Steinwedel with a north wind. Wheat straw alone from a threshed crop may not amount to much for working horses, but how often in times of scarcity it would be the means of saving valuable farm stock. Times of dearth have visited us in the past, and doubtlessly they will again. Why not prepare for them in this way? It is no exaggeration to state that hundreds of horses, horned cattle, and sheep have perished of starvation during the last ten years in this district which a stack of straw on each farm would have saved. We are too apt to forget the famine years when the seasons are fairly good, and to allow the succeeding one to catch us unawares, like a thief in the night. There may be some farmers present who prefer the header to the thresher because of the better condition in which the straw is left for stacking and cutting into chaff. There are disadvantages I could name with regard to the header, and personally I prefer the thresher. It would be out of place in this paper to enter into the details of working such a plant as is herein advocated, further than to express the view that one or two men only should be permanently employed to travel with it, leaving the farmer whose stack is to be treated to find other necessary labor. It is useless to shut our eyes to the fact that the days of 5s. per bushel for wheat are over, except under local or extraordinary circumstances. When we have a surplus we must compete in the world's markets, and we have to grow wheat at 2s. a bushel to do it. The isolated cockie is not able to do it, but by co-operation and cohesion we may. "United we stand, divided we fall" *does* apply to farmers. As an instance of what can be done by combined effort, T. K. Dow, in one of his excellent papers on "American Productions" in the *Chronicle*, describes a huge harvester in use, travelling from farm to farm, the owners of which contract to cut and thresh the crop, clean and bag the grain in one operation, binding the straw and dropping it in 5cwt. bundles, the cost to the farmer being about 1s. per bag. In other ways every effort is made to cheapen the cost of production, and it is declared possible to produce a bushel of wheat for from 23 cents to 26 cents. If we can—by combination—secure a stock of straw as a standby on half of the farms in our district, we will do a good job; and if this is the best means of providing immunity from starvation and loss of stock when the next bad season comes, we are in honor and justice bound to do it.

The GENERAL SECRETARY said Californian thrashing gangs, comprising nineteen hands, will go from field to field on a farm, shift the plant four or five times a day, thrash, clean, and bag fit for market at 4d. per bushel. They find their own caboose and cook, thus saving all trouble to the farmer's wife. Port Germein Branch purchased a thrashing plant, and members appeared to be much pleased with the success of their venture for a year or two, but latterly he had heard nothing about it. McLean Bros. & Rigg had been promised, by the farmers in a certain locality, a lot of work for a thrashing plant if they would send it up with a gang of men, but when they sent the machine and gang the farmers went back from their promise and there was very little work to be done. The venture resulted in heavy loss to the firm.

Mr. JOHNSON gave an account of his experiences in the early days, when he had to pay very high prices for hand-reaping and mechanical thrashing. When the stripper came into vogue he got his work done at very much lower prices, and he intended to stick by the stripper all the time.

Mr. A. L. MCEWIN said farmers now require about £300 worth of implements which are used only for a portion of the year, but the interest is going on all the time. There is not so much loss in the use of the stripper as is often supposed.

Mr. J. MILLER, M.P., thought that a co-operative ownership of fifty farmers in a thrashing plant would be too extensive. So many of them would want to use the machine at the same time. Twenty-five would be quite large enough a co-operation.

Mr. D. KENNEDY said the leading idea was the saving of straw in its best condition as a stand-by for live stock in times of scarcity. It would be a good thing if every farmer were to cut and bind a fair proportion of his wheat crop whilst it is in its firm dough stage, and as long thereafter as possible. It would be more practicable for one man to buy a thrashing machine and thrash for the farmers, as is done in the South-East. But he should have a guarantee from the farmers that they would give him the crop from a certain number of acres to thrash. Where a number of men own a machine there is difficulty in regard to the care of it as well as in the use.

Mr. W. P. CUMMINS, M.P., said farmers ought to reap and bind a portion of their crop early, thus minimising risk of loss from storms, &c., and providing a quantity of useful fodder for their live stock. He did not favor co-operation in this line, but suggested a thrashing gang, with their own cook, for he appreciated the worry and work entailed on the farmer's household by the advent of an army of strange men, when food had to be provided for them. In New South Wales two or three experienced men go with the thrasher, and the farmer finds the rest of the laborers.

Mr. MCEWIN said he was no novice in saving straw, but his brother had a disc-header, and he had arrived at the conclusion that it cost more to save the straw than to cut the whole crop in the first place for hay.

Mr. R. BARR, in reply, said he hoped all the Branches would consider this matter, and arrive at some practical conclusion.

Wheat v. Hay for Horsefeed.

Mr. A. L. MCEWIN read the following paper:—

Feed for the working stock on a farm is one of the items that always has to be provided whatever the season may be, and it often is a difficult matter to make provision when the season sets in a dry one; crops are short and light where the country has been scrubby when the farmers settled on it. Hay is a difficult thing to harvest, and it takes a lot of ground to get a few tons. In fact, sometimes it is impossible to get it, and then my experience is that hay alone is not sufficient for a horse when continuous work is required of him. It is a singular thing that few farmers agree as to what a horse requires to keep in the condition he should be when he has a great amount of work to do. There is, probably, not one farmer amongst six who would know what amount of feed in weight should be given to a team of horses if they had heavy work to perform. On an average they require 40lbs. hay per day, but if in heavy work they will require some grains added to keep life and condition up. Now, if feeding four horses continuously, 25 tons hay would be required for the year at the rate of 40lbs. per day. I have made an estimate that in a clean crop of wheat, on ordinary light soils, where it will cut a ton of hay it will reap 16bush. of wheat. Sixteen bushels of wheat on twenty-five acres would give 400bush. of wheat, and this fed to horses at the rate of ½gall. per horse per feed would feed four horses for over thirteen months. This, of course, would require that each got something else with the wheat, and if fed with wheaten chaff at the rate given they would do half as much more work that a team would do if fed on hay alone. This at first sight would appear to prove that to feed on wheat would be the most profitable, but if we compare acre for acre the hay would come out the better, as there would not be sufficient wheat husks or chaff to feed with the wheat. A fair feed for four horses would be one bag (loosely filled) wheaten chaff, with 1½gall. of good wheat. With horses fed in this way it would be found that a tremendous amount of work would be got through. A friend of mine working six horses in a wagon, doing very heavy work and long days, gave me his course of feeding. These horses were in prime condition, with coats as sleek as a racehorse. They got two feeds a day of wheaten chaff, a bag and a half per feed, with two 2lb. jam tins full of wheat for each horse carefully measured out, with as much hay as they would eat up properly for evening and night feed ; they were not allowed to waste a straw. This at once showed me the advantage of feeding largely on wheat, both for economy and with advantage to the horses. I trust my paper will not stop any farmer from cutting hay, as I am a firm believer in a good stack of hay, and there is not so much risk as in waiting for the wheat. Still those farmers who are not able to cut hay may take heart, if they have any wheat at all, that they are not altogether destitute of horsefeed, and instead of purchasing hay may utilise what they have.

Mr. G. W. Bawden was used to feeding his horses with about 3pts. of boiled wheat, mixed with a good quantity of wheat husks (chaff).

Another member preferred crushed wheat, than which he knew of nothing better for hard-worked horses.

Mr. D. Kennedy used neither whole grain nor boiled grain, as he could not depend upon the wheat being properly boiled where he had to rely upon others. Horses become weak when fed upon raw wheat, or when it is only parboiled. He would crush the grain and mix it with the chaff slightly moistened, then the meal adheres to the chaff; raw wheat is not a safe feed for horses.

Mr. A. Sharman would scald the wheat in kerosene tins and allow it to remain in the scald for three or four hours before use.

Mr. W. P. Cummins, M.P., would not use whole wheat or raw wheat, as it causes the horses to lose their hair. He preferred chaffed hay with a fair quantity of grain in it. Hay should be cut when the grain has formed and got beyond the milky stage, when it is at its sweetest and best time for hay ; if cut earlier it is greener, but less nutritious and strengthening.

Mr. T. B. Wicks, Arthurton, said the matter of horse feeding was of the greatest importance to farmers, but many have failed through not knowing how to feed. Too much wheat is injurious to horses, and it is better to feed them with oats. When a farmer has a limited area of land, and cannot spare any for growing oats, he may depend upon wild oats after a crop of wheat. The land is rather the better for having produced a crop of oats.

Mr. J. Miller, M.P., said Victorian farmers have a great preference for oaten hay. It would be decidedly advantageous to grow alternate crops of wheat and oats for hay. Oats thrive on sandy country. He thought Cape oats would give most satisfaction. More work can be got out of horses on oats than on anything else. Military men in Europe prefer oaten to any other hay.

Mr. R. W. Bawden strongly recommended the Champion oat, introduced by the Central Bureau. Stock will even eat the stubble clean out of the ground before touching other stuff on the same field.

Mr. W. H. Hawke said the Champion oat is of very rank growth, and no good. The Scotch Grey oat and the Dun oat were both good sorts.

Mr. R. Barr said he would deprecate feeding too much wheat to horses. In proper and reasonable quantities it was a very good thing, but when fed too liberally it was likely to affect the animal injuriously.

The Standard Bushel.

The **General Secretary**, by request, read Professor Lowrie's remarks upon this subject at Gladstone and Quorn, and after a lengthy discussion the two resolutions adopted at Gladstone and Quorn were also unanimously adopted here.

Experiments with Wheats.

Mr. D. **Green**, Bute, read the following paper:—

I have been experimenting during the past season with a few cross-bred wheats, and now have much pleasure in giving you my opinion concerning the varieties. Every farmer realises the importance of having the purest seed and the best varieties adapted to the locality in which he is farming. All farmers should pick out the largest and best developed heads in any crop, taking particular care to keep the heads of the different varieties separate. Now we have the seed drills in use it is very simple to sow these picked samples separately, and harvest them separately, and in two or three years the farmer would have a nice quantity of pure seed, and after, if he had more than he required for his own use, many farmers would be pleased to give him 3d., 6d., or even 1s. per bushel above market price for seed. [Mr. Green here mentioned two instances where he had purchased seed supposed to be pure, but which was badly mixed with other varieties.] Of course it is next to impossible to keep two varieties separate when sowing them in the same paddock with the ordinary broadcast seed sower unless you cut roads three or four chains wide, but with the seed drill it can be managed satisfactorily. The piece of land selected for my experiments was the western slope of a sandhill that had been fallowed up wet in the previous August. The land had in no way been disturbed until I was going to put in the seed; then I went over it with a hand hoe and hoed up all the weeds. I then mixed the seed with the manure, and set the drill to sow at the rate of 74lbs. of Lawes' English superphosphate, 36 to 38 per cent. per acre. This was in the first week in May.

Austen Lee.—A cross between Steinwedel and Australian Club. I only had a few grains of this wheat to sow, and did not retain it at harvest. It did not stool out well; appeared a bad wheat to go down, being very weak in the straw; appeared to shake out badly, this feature being derived from its parent, Steinwedel. Ripened in the third week of November.

Nonpareil.—This wheat is an old favorite in some districts, being a wheat that develops good well-filled heads under favorable circumstances, but of late years has got greatly mixed with other varieties. The sample that I have has been carefully selected by Mr. W. Farrer, wheat specialist to the New South Wales Government. This wheat, with me, stooled out well, and developed well-filled heads, has a stout straw, stands up well, and does not shed its grain; it is a good milling wheat. Ripened in the third week of Novewber. Yield not estimated, as I only had a few grains to sow.

Warroo.—A cross between Blount's Lambrigg and Hornblende × King's Jubilee. This stooled out fairly well, but is weak in the straw, and went down badly, this feature being derived from its parent, King's Jubilee; developed into medium heads, and does not shed its grain. Ripened the second week of November. I sowed 6ozs. of this wheat and reaped 14lbs. of seed, being an average of 19bush. per acre.

Field Marshal.—A cross between Improved Fife and Marshall's Prolific. This variety stooled out remarkably well, has a stout straw, stands up well, and does not shed its grain; has well-developed heads, well filled. It will make a good late wheat, though it is rather of a flinty nature. Ripened in the latter part of the fourth week of November. I sowed 8ozs. of this wheat and reaped 27lbs. of seed, being an average of 27bush. per acre.

Tazai.—A cross between Hornblende and Lazitan. Lazitan is a wheat originally procured from India. It stooled well, has a fairly stout straw, stands up well, has rather small heads, but well filled, and does not shed its grain. I think this wheat would make a good hay wheat, as it much resembles the Tuscan in the straw, and grows to a good height; ripe in the third week of November. I sowed 7ozs. of this wheat and reaped 17½lbs., being an average of 19bush. 50lbs. per acre.

Kirby.—A cross between Improved Fife and Hornblende. This variety stooled out fairly well, has a stout straw, stands up well, and does not shed its grain; has fair-sized heads, and well filled; ripe in the third week of November. I sowed 8ozs. of this wheat and reaped 18lbs. of seed, being an average of 18bush. per acre.

Straight Vote.—A cross between Populist and Vanessa. Parents—Populist, a cross between Purple Straw and Vanessa; Vanessa, a cross between Hornblende and Indian A This variety stooled out well, has a stout straw, stands up well, develops large, well-filled heads, and does not shed its grain. I think it will prove a good medium early wheat, ripening as it does in the second week of November; it appears to be a good milling wheat. I sowed 1lb. of this wheat and reaped 47lbs. of seed, being an average of 23½bush. per acre.

In all I sowed 2lbs. 13ozs. wheat and reaped 123½lbs. seed, or an average of nearly 21½bush. per acre. These wheats were all sown without being subjected to any form of pickling, and at harvest did not develop the slightest form of bunt, although the sand was quite wet when I sowed the seed.

Mr. **Green** also referred to the necessity for having the different varieties of wheat fully tested for their flour and bread-making qualities, and the General Secretary informed him that a flour-testing mill had already been imported by the Department of Agriculture.

Mr. D. **Kennedy** would like to learn how many years it would take to properly fix and establish the character of cross-bred wheat. (A voice—Eight to ten years) He had purchased ten bags of Rattling Jack wheat and got a fine crop of pure Rattling Jack, but when he sowed that seed again he got quite another variety, with no Rattling Jack in it.

Several members thought "an enemy had come in the night" and changed the seed; they could not account for the thing otherwise.

Conclusion.

Owing to the members for Kadina and Paskeville having to attend the Local Court, and several others who had promised to read papers not being present to fulfil their promises, the proceedings had to be limited to the morning and afternoon sessions, but a small meeting was afterwards arranged for the evening, when the General Secretary discoursed upon "The Necessity for and Advantages of Forest Tree-planting."

Next Conference.

It was decided to hold the next Annual Conference during February, 1901, at Port Broughton.

Thanks.

A comprehensive vote of thanks was accorded to all who had taken part in the present Conference.

REPORTS BY BRANCHES.

Bowhill, January 20.

Present—Messrs. A. Dohnt (Chairman), G. Knight, J. McGlashan, E. Weyland, W. G. F. Plummer, H. Baker, and H. H. Plummer (Hon. Sec.).

Mannum Conference.—It was decided that the whole of the Branch attend as delegates to conference of Murray River Branches to be held at Mannum on February 27. Two members promised to contribute papers.

Bags as Wheat.—The practice of buying wheat at gross weight and making no allowance for the bag was warmly discussed, the practice being characterised as robbery of persons unable to help themselves. The farmers in this district lost 5½d. on every bag they sold. It was resolved that this Branch is strongly opposed to the system of selling bags as wheat, and ask the other Branches to join in protesting against an unjust principle. Several members advocated farmers joining the Farmers' Co-operative Union in sufficient numbers to make the organisation absolutely independent of the practices adopted by other buyers. Some discussion took place on the question of weighing wheat. A member pointed out that the buyers would not accept the farmers' weight, while the farmers had to take the millers' weights of flour, bran, pollard, &c., as correct.

Mending Wheat Bags.—The Chairman stated that he had tried putting patches on torn bags with flour paste instead of darning the holes. The fringe should be cut clear, a flat board placed under the tear, the patch inserted on the inside of the bag and ironed with a hot iron. It was much quicker than darning the tears, and he believed just as effectual.

Port Elliot, January 27.

Present—Messrs. J. McLeod (Chairman), H. Green, sen., J. R. Coote, W. E. Hargreaves, H. Pannell, J. Davidson, J. Nosworthy, J. Lovell, E. Hill (Hon. Sec.), and two visitors.

Fruit-growing.—This meeting was held at Mr. Hargreaves' garden at Cuthill, in the ranges back of Port Elliot. Members considered that the promising condition of the young orchard fully substantiated the statements made by Mr. Hargreaves in a paper on "Fruit-growing" read at a recent meeting of the Branch. A vote of thanks was accorded to Mr. Hargreaves for his hospitality.

Late Chairman.—The Hon. Secretary was instructed to send a letter of condolence to the family of the late Chairman, Mr. P. O. Hutchinson.

Wheat Experiments.—Mr. J. R. Coote tabled samples of wheat grown by himself. He obtained thirty-seven bags of Dart's Imperial wheat from six acres, and from one bag of seed of Acme he obtained twenty-one and a half bags.

Bakara, January 11.

Present—Messrs. H R. Hayward (Chairman), R. Hayward, R. Barrow, R. Wilson, J. Bates, W. G. Wilson, J. E. Dietrich, T. Herrmann, F. Mertens, E. A. Hayward, E. Wall, J. V. Barrow (Hon. Sec.) and four visitors.

Feeding Horses.—Considerable discussion took place on feeding and working horses. The majority of members agreed that it was important to give the horse only as much food as he would clean up properly. A gallon of bran and pollard mixed with wheat chaff was considered a fair quantity of "corn" to give as a feed. Oats found particular favor as horse feed. Mr. Wilson thought a horse should have two short feeds daily, viz., morning and noon, with long hay at night. It was agreed that "spoutings" or "headings" were injurious to horses. Eight hours work a day was considered enough for a horse. Mr. Dietrich said half an hour's work after sundown took as much out of the horse as an hour's work in the daytime.

Harvest.—It was estimated that the district averaged last season about 5bush. of wheat over an area of about 5,000 acres.

Elbow Hill, January 15.

Present—Messrs. E. Wake (Chairman), C. G. Ward, W. Spence, W. Ward, J. Ellaway, G. Wheeler (Hon. Sec.), and four visitors.

Forestry.—Messrs. Ward and Wake agreed to raise plants of sugar gums from seed for free distribution to other members.

Sheep.—Mr. E. Wake initiated a discussion on keeping sheep on farms. He advocated keeping a few sheep on all farms, and gradually adopting the system, so as not to depend entirely upon the wheat crop The troublesome turnip weed was good feed for sheep, and, besides helping to clear the land of this, they got rid of a lot of other undesirable weeds. Mr. Ellaway asked how much land would be required in this district to keep, say, 500 sheep and have 300 acres in crop each year. He found that it required a lot of land to keep a few sheep in this district, and they eat the heart out of the feed; still they were very profitable. He would like also to know the best ram to cross with Merino ewes. The Chairman considered 3,000 acres would be sufficient for feeding 500 sheep; he advocated the use of a Dorset ram as best both for wool and mutton.

Harvest.—Members considered that the average yields for the hundred of Hawker would be 3½bush. wheat and 10cwts. hay. Rainfall for 1899, 9·91in.

Hartley, February 2.

Present—Messrs. A. Dalton (Chairman), J. Jaensch, H. Reimers, J. Stanton, A. Thiele, H. Lehmann (Hon. Sec.), and one visitor.

How to Make the Branch More Useful.—Short papers on "How to Make the Meetings of the Branch more Attractive and Useful" were read by Messrs. Jaensch, Thiele, and Lehmann, and a good discussion followed. The following were the principal points brought forward:—Each member must accept his individual responsibility in the matter, and look upon it as a point of honor to take a fair share in the work of the Branch. The work is not limited to improving agricultural practices, but rightly extends to the social life of the producers. The *Journal of Agriculture* should be carefully studied to note the work of other branches, and by comparing their experiences with our own we must benefit. To make the meeting helpful and attractive each member should take a note of anything out of the ordinary that he notices. Anything that has proved beneficial or interesting to himself is likely to prove the same to his fellow-members. At present most of the work is left to the Hon Secretary and one or two members. As most of the members are practical farmers there should be no difficulty in each one having some useful experiment or experience to report when his turn comes. Members should also make it a point to be regular and punctual, while the Chairman should enforce the ordinary rules of debate: see that members speak to the subject under discussion, and that while anyone is speaking not allow members to chat to each other. The farmers were the backbone of the country, and the greater interest and intelligence they put into their work in the adoption of new and systematic methods of cultivation the better for themselves and the country. Intelligent discussion of practical matters at their Bureau meetings would do much to improve the condition of the producers. It was decided to place a question box in to local post office to endeavor to induce the general public to take an interest in the meetings of the Branch. [Where question boxes are placed in public positions a notice containing a cordial invitation to visitors should be affixed, and should show date and place of next meeting and subject to be discussed.—Gen. Sec.].

Harvest.—Returns for past season vary from 4bush. to 8bush. or 9bush. per acre.

Dawson, January 27.

Present—Messrs. R. Renton (Chairman), P. J. Byrne, C. W. Dowden, A. J. Hooper, C. F. W. Just, W. Kelly, C. H. Meyers, A. H. Warner, and A. F. Dempsey (Hon. Sec.).

Relief Fund.—Most of the time of the meeting was occupied in discussing arrangements in connection with fund being raised for relief of those farmers in the district who had their crops destroyed by the disastrous hailstorm last season.

Woolundunga, January 15.

Present—Messrs. H. Aldenhoven (in chair), J. Grunike, T. H. Prosser, S. Levick, J. G. Moseley, G. Foulis, J. H. Michael, and N. Rogers (Hon. Sec.)

Rabbit Poison.—Mr. J. Grunike read the following paper:—

Take a stick of phosphorus 3in. or 4in. long and break it into three or four pieces about 1in. long; drop into a pickle bottle; pour on this sufficient bi-sulphide of carbon to barely cover the phosphorus. This will thoroughly dissolve the phosphorus in twenty minutes. Pour the contents of the bottle into a tub containing about 4galls. of water into which 4lbs. to 6lbs. of sugar has been previously dissolved. Stir this for a few minutes and then add pollard, stirring all the time until it gets stiff enough to make pellets. When breaking the phosphorus have water handy to dip the stick into in case it ignites. It is advisable to have water in the pickle bottle when dropping the phosphorus in, which can be drained off before pouring in the bi-sulphide of carbon. Chemists or storekeepers will procure bi-sulphide of carbon from town, cost about 2s. a large bottle. A bottle will dissolve over 1doz. sticks of phosphorus. Lay pellets in warrens and creeks, under bushes, anywhere where stock cannot get them; but, where practicable, the most effective way is to lay baits in freshly-ploughed furrows.

Stansbury, February 5.

Present—Messrs. Alex. Anderson (Chairman), P. Cornish, J. Henderson, H. C. Pitt, P. Anderson, G. Brundell, G. Jones, J. Sherriff, C. Faulkner, and one visitor.

OFFICERS.—Mr. P. Cornish was appointed Hon. Secretary in place of Mr. George Sherriff, resigned.

BROOMBUSH.—A member wished to know whether the broombush (Melaleuca uncinata), which is largely used in the construction of sheds, thatching stacks, &c., is poisonous. [No. It possesses abundance of oil similar to cajeput, which is a valued remedy for affections of the breathing organs.—GEN. SEC.]

AVERAGE SAMPLE OF WHEAT.—Members consider it a great shame that bunted wheat should have been accepted by the corn trade section of the Chamber of Commerce and mixed with the other samples to be sent to Europe as an example of the "fair average quality" of the present season's crop, and they decided to send a vote of thanks to the President of the Royal Agricultural Society for publicly directing attention to the matter. [Prior to that the Professor of Agriculture and several other members of the Central Agricultural Bureau directed public attention to the very unsatisfactory f.a.q. sample that had been sent to England.—GEN. SEC.]

Carrieton, February 1.

Present—Messrs W. J. Gleeson (Chairman), M. Manning, A. Steinke, N. Travers, J. F. Fisher, F. Vater, J. McNamara, F. Kaerger, and J. W. Bock (Hon. Sec.).

BLUESTONE.—Members were pleased to know that the Central Bureau was about to investigate the question of adulterated bluestone.

FOREST TREES.—Mr. A. Steinke and N. Travers undertook to raise forest trees for free distribution to members.

REPORTS ON EXPERIMENTS.—Mr. Vater said he sowed a bushel of Bartlett's Crossbred wheat. It is an early variety and would have given a heavy return had not the rabbits attacked it. As it was he harvested only 3bush. Steinwedel, and Purple Straw gave only 3bush. per acre. Mr. Travers sowed 1bush. of Bartlett's Crossbred and reaped 7bush. and 46lbs. per acre. The next best wheat was Angas's Purple Straw. Steinwedel gave about as much, but when sown late this gave a better return. Mr. A Steinke sowed 1¼bush. Bartlett's Crossbred and reaped 16bush. 16lbs., but this wheat is weak in the straw and breaks down. Twenty-four ounces of Indian King yielded 12½lbs., and this will be sown again. It ripens early, has tough straw. Two bushels 13lbs. of Allora returned 14bush. 8lbs. This is a good locust-resistant wheat, stands drought well, but does not make good hay. Early Para averaged 2bush. per acre, Steinwedel 2½bush., Barootа Wonder 1½bush, with a very plump grain. Mr. Kaerger got his best return from a bushel of Bartlett's Crossbred, which gave him a bag of good wheat. Steinwedel averaged 2bush. per acre, Velvet Pearl 2½bush., very small in grain. Mr. Manning's crops were nearly destroyed by locusts. Mr. W. J. Gleeson got his best return from Steinwedel, which averaged nearly double that of Purple Straw, as the latter was badly affected by frost. Mr. J. McNamara sowed 10lbs. of Bartlett's Crossbred, and reaped 35lbs. This was the best wheat he had, both in appearance and return; the other varieties were all more or less failures. Mr. Bock had found Steinwedel give double the yield given by Purple Straw grown under similar conditions.

DRILLING SEED AND MANURES.—Mr. J. F. Fisher urged members to experiment with the seed drill. After discussion members agreed to have some seed put in separate plots with differing manures this season, to find whether this will give better results than hitherto on their white lands.

HORSE DISEASE —Mr. A. Steinke said his horses often roll, stand about, and refuse to feed. Members thought this is due to a poison weed which is growing amongst the dry feed. [More likely to be sand in the stomach. Mr. Valentine recommends a little gin and linseed oil, with bran mashes —GEN. SEC.]

Mallala, February 5.

Present—Messrs. H. B. Moody (Chairman), G. Marshman, S. Temby, A. F. Wilson, F. M. Worden, Jas. McCabe, A. Moody, G. W. Bischof, W. Temby, W. R. Stephenson (Hon. Sec.), and two visitors.

FERTILISERS.—Mr. R. Butler, M.P., attended by invitation, and gave an address on "Fertilisers." He was convinced that, even in this dry district, if used judiciously, manures would greatly increase the yield of wheat He gave an outline of the Fertilisers Act, which is an improvement on that of 1894, though further improvements are needed. In the Chief Inspector of Fertilisers the department had a zealous and exceedingly efficient officer, and he did not think farmers need have any fear that they would not get value for their money under the present system of analyses. The Act was also a protection to the honest trader. Manures should only be used on fallowed land. Those who wanted quick returns should use only well-known brands of superphosphates. In discussing the above remarks the Chairman thought from 1½cwt. to 2cwts. should be put on if the farmer could afford it, and this should be thoroughly distributed on the land, else he thought the crop would suffer from burning. He preferred English super. Some members wished to know whether superphosphates would suffer from being mixed with ashes, farmyard manure, sheepyard manure, &c. [Ashes contain much lime, and this lime would act upon the phosphoric acid and cause it to "revert" to the insoluble form, therefore it would be most unwise to mix ashes or any substance containing lime with superphosphate. Bonedust, however, may have fresh wood ashes mixed without any bad result.—GEN. SEC.].

Auburn, February 8.

Present—Messrs. W. R. Klau (Chairman), G. R. Lambert, A. C. H. Limbert, J. E. Isaacson, W. F. Keynes, E. M. Dudley, J. T. Kirkbright, S. Ford, and one visitor.

SUMMER FODDER.—Mr. Isaacson tabled sample of sorghum grown by aid of irrigation. The seed was sown in October, and had been irrigated once a fortnight since. The crop is about 6ft. high, while the second growth where some of the crop was cut is 3ft. in height. The water for irrigation was raised by means of a McCormack water-lifter from a well near the bank of the River Wakefield. Horsepower was used to raise the water,

Crystal Brook, February 5.

Present—Messrs. George Davidson (Chairman), W. J. Venning, J. C. Symons, W. Natt, A. Hamlyn, W. Weston, and G. Miell (Hon. Sec.).

CONFERENCE.—The whole evening was occupied in discussing matters in connection with the forthcoming Conference of Mid-Northern Branches to be holden at Gladstone.

Pyap, January 24.

Present—Messrs. B. P. H. Cox (Chairman), G. Napier, J. Harrington, W. Axon, A. J. Brocklehurst, G. H. Mills, H. Knight, E. Robinson, C. Billett, J. F. Bankhead, J. Bowes, and one visitor.

EXHIBITS.—Mr. Cox tabled fair samples of Chinese sugar marrow and long green bush marrow grown from Central Bureau seed; also yellow tomatoes, supposed to be King Humbert, which is described as glossy scarlet.

PESTS.—Rabbits and crows are abundant, and doing much damage.

RAINFALL.—For 1899, 12·04in. For 1898, 7·87in.

Albert, February 3.

Present—J. Wetherall (Chairman), W. H. Stengart, W. Freer, J. Head, R. C. Rasmussen, R. Norton, C. Setterberg, H. L. Smith (Hon. Sec.), and several visitors.

EXHIBITS.—By W. Freer, large trombone and pumpkin, seeds of which were distributed.

STRIPPER V. BINDER.—Mr. Rasmussen was of the opinion that the stripper loses more wheat than the string-binder. Mr. Wetherall did not think the saving of grain affected by using the binder would compensate for the extra labor. He would, however, cut enough with the binder to make a good stack, but would certainly harvest the principal part of his crop with the stripper. The Hon. Secretary doubted whether much wheat is lost by the stripper. [Why not settle the doubt by careful investigation? There are many farmers who have examined their fields after the stripper, and who assert that the loss is very considerable in some cases whilst the loss after the binder has been insignificant.—GEN. SEC.]

Wilson, February 3.

Present—Messrs. D. McNeil (Chairman), W. H. Neal, H. Need, R. Rowe, F. Matthews, H. Ward, T. Barnes, A. Canning (Hon. Sec.), and one visitor.

DRILLING IN SEED.—The Hon. Secretary read correspondence *re* purchase or hiring seed and manure drill for experimental work. Considerable discussion took place, but members did not consider it advisable for the Branch to purchase a drill, as complications might ensue, but would support any syndicate formed in the district to obtain a drill.

Millicent, February 1.

Present—Messrs. R. Campbell (Chairman), H. F. Holzgrefe, H. Hart, T. J. Stuckey, H. Oberlander, W. R. Foster, H. Warland, Geo. Mutton, B. Varcoe, H. A. Stewart, and E. J. Harris (Hon. Sec.).

BLUESTONE.—Members stated that as far as their experience went nothing but pure bluestone had been sold in the district. Mr. Hart said he had one sample which appeared suspicious under the tea test, WOOL-CLASSING.—Arrangements for classes for instruction in wool-classing, under the direction of Mr. Geo. Jeffrey, of the South Australian School of Mines, were dealt with.

DAIRYING.—The Chairman called attention to comparisons between the dairying industry in Victoria and South Australia. The former colony exported over 14,000 tons this season, while we sent about 800 tons. He thought the export trade could only be increased by the farmers isolated from factories going in for separators and sending the cream to Adelaide. If butter were sent it would only glut the local market. Mr. Holzgrefe said some of those in the district who had gone in for separators had now given them up, and were supplying milk to the factories again. Mr. Stuckey said it must be remembered that Victoria had been engaged in the export trade longer than South Australia, hence her position. Members agreed that federation would greatly aid the export butter trade.

DRAINAGE AND ITS RESULTS.—Mr. Stuckey referred to question of draining isolated and inland waters such as Bool Lagoon, Lakes Omerod, Cadnite, and Frome. In his opinion such work would not only be a waste of money, but would have a disastrous effect on the surrounding country. Evaporation would be interfered with, and the rainfall would suffer. Members instanced the good results in the district from drainage operations, and some doubted whether the rainfall had been affected in any way. It was thought that it would be better if more profitable use were made of land already available than to drain fresh land. The Hon. Secretary furnished particulars of rainfall for past twenty years, compiled by himself. These showed that the rainfall for December, 1899, had only been exceeded during December about half a dozen times during the twenty years, while the January fall had only twice been exceeded.

PIG FARMING.—The Chairman read the following paper on this subject:—

There is a feeling of satisfaction to find that a contention made on theory comes out correct in practice. The writer has often contended that, given a fair price for pig meat or bacon, the most profitable way of disposing of cheap grain would be to turn it into pork, and now, having had some experience in the matter, particulars are here given. Before going into such an undertaking, it is necessary to have a supply of food assured, as both pigs and food cannot well be raised at the same time. It was found necessary, therefore, to purchase pigs for a start, and they were at once put into a ten-acre wire-netted plot and fed with wheat in the sheaf. As they grew large enough to fatten they were drafted off into the fattening pens and topped off either with whole grain or meal the former being found by far the most economical, as, having no mill on the farm, it was necessary to cart the grain into the mill and back again. Many have tried feeding whole grain and voted it a failure, and rightly so from the manner in which it was tried. If only sufficient grain for a feed is given from time to time, the pigs will bolt it, and the grain will certainly be wasted and the pigs will not fatten. If, when pigs are first put in the fattening pen, sufficient mush is given to about gorge them and they will eat no more, then fill up the trough with dry grain and never let it become empty, a different result will follow. Keep another trough filled with clean water. As soon as each pig begins to feel hungry it will come to the wheat, chew it leisurely, and very little will be wasted. When several are penned together, many will often be lying down while the others are feeding. The best kind of trough to use would be about 15in. wide, with a post at each end carrying a 6in. board about 3in. above the trough, battens being nailed across the trough about 9in. apart. The board would prevent the pig from getting into or over the trough, and when it raised its head to chew its nose would be under the board, and any grain falling from its mouth would go back into the trough. After a while the wheat will generally get dirty through being nosed about. If water is put into the trough the pigs will be enabled to get the grain without the dirt, but on no account allow the whole of the grain to be eaten up. Better take out the dirty grain and give it to the store pigs. The pigs referred to, about thirty—from suckers to well-grown stores—were bought in the middle of February, and the opinion was expressed that "only nine of them could be got into condition for the killing that year." They were all well fattened and disposed of before the 7th of September without undue forcing. Only against one particular pen was an account kept of food eaten, which was as follows:—On the 1st August eleven pigs, valued at 25s. each, and to the 4th September they disposed of eleven bags of wheat, valued at 9s. per bag. Cost of pigs, £13 15s., value of wheat, £4 19s.; total, £18 14s. The pigs were sold alive in Adelaide, and netted £26 7s. 11d., or about £2 4s. 9d. each. Nine of these were half-bred Tamworths, and the other two nearly pure Berkshire with a Tamworth cross. The latter realised 21s. less than the former. The pigs were the same age, and from the time they were weaned they had exactly the same treatment, being all fed together. Another pen, with a couple of weeks extra feeding, netted £2 11s. 3d. each. These were all half-bred Tamworths from Berkshire sows. In addition to the price realised for the wheat, the bags were saved, and seven-eighths (estimated) of the manurial value of the grain was left on the farm. Of course it must be admitted that fat pigs realised a fair price all the winter, and such was the case on account of so few persons being in the business, but then this is for only little more than provincial consumption. If the industry were conducted as systematically as, say, the sheep industry, and export trade could be opened up, and, as was recently pointed out, men are ready to venture largely into the business if a supply of pigs were guaranteed. Even now the S.A. Export Depôt has facilities for dealing with the pork export in much larger and in more ways than have yet been availed of The following is the balance-sheet asked for by the members:—

Cr.	£	s.	d.	Dr.	£	s.	d.
February 15th, 1899.				By Proceeds of pigs killed	15	0	0
To Pigs purchased	51	2	10	Fourteen sold alive........	35	6	0
Wheat and peas in stack,				Eleven do.	26	7	0
and swedes	15	0	0	Eight do.	16	8	0
Wheatfed, whole and crushed	37	10	0	Eight do.	13	14	10
Crushing and carting wheat	2	0	0	Eleven do.	11	16	9
Pigs on hand	12	0	0	Pig killed and cured	2	0	0
Profit and loss account	66	9	9	Value of pigs on hand on			
				December 31st, 1899....	63	10	0
Total	£184	2	7	Total	£184	2	7

The last two lots were sold too near Christmas for bacon curing, hence the low prices. During the week in which the last lot was sold and the week previous nearly 1,700 pigs were yarded.

In reply to members the Chairman said most of the pigs were Tamworth-Berkshire cross, and were fed in narrow troughs. Members joked about their long noses, and suggested that a 15in. trough would hardly be wide enough. Messrs. Rich, Mutton, Holzgrefe, and Harris characterised the Tamworths as voracious gluttons. The Chairman and Mr. Hart said that, when fattening, pigs should never be allowed to get hungry. The former said if a pig were given all it would eat it would fatten on less food than if more food were given during an extended period.

Exhibits.—The Chairman showed well-grown samples of Early Rose, Bruce, Breeze's Peerless, Redskin, and Pink Eye Don potatoes, and Paspalum dilatatum, 3ft. 6in. high, a useful summer grass.

Rainfall.—For year ending December—Millicent, 25·29in.; Mount McIntyre, 30·86in. For January—Millicent, 2·30in.; Mount McIntyre, 2·06in.

Kapunda, February 3.

Present—Messrs. J. J. O'Sullivan (Chairman), W. Flavel, G. Teagle, W. M. Shannon, Pat Kerin, J. H. Pascoe, Peter Kerin, J. H. King, J. O'Dea, and T. Jeffs (Hon. Sec.).

Fertilisers.—Members reported their experiences with fertilisers. Mr. Teagle had not been very successful, due, he believed, to the fertiliser he purchased being of inferior quality. Mr. Pat Kerin had fairly successful results with bonedust, while Mr. Shannon considered bonedust and guano unsuitable for this district. He used English super., and on a very poor piece of land he put 1cwt. to the acre, and obtained a return of 23bush. of wheat per acre. This land would not even grow grass without manure. Mr. Pascoe got double the average from a small paddock he manured than from the adjoining paddock put in without manure,

Cradock, February 10.

Present—Messrs. R. Ruddock (Chairman), P. Gillick, J. Paterson, T. Marsh, P. O'Dea, J. H. Lindo (Hon. Sec.), and one visitor.

SEED EXPERIMENTS.—Mr. Paterson sowed Indian King and Bartlett's Crossbred wheats in plots side by side. Portions were manured with superphoshate, Sugar Refinery super., and Naracoorte guano, and portion was left unmanured. In each plot the crop was about 3ft. high and yielded a good sample, but he found no difference in the returns from the different plots. Melons, pumpkins, marrows, and Kaffir corn did well for a time, but the dry weather and the grasshoppers finished them off before arriving at maturity. Mr. Marsh had no success with summer crops owing to dry season. Mr. Iredell grew Bartlett's Crossbred and Indian King wheats, both of which did remarkably well under irrigation, but the sparrows reaped the grain.

WHEATEN HAY AND STRAW.—Mr. Paterson stated that he had stacked straw and hay in alternate layers, and found that the aroma from the green hay impregnated the straw while pressed in the stack, making it more palatable. The whole mixture made good horse feed, and the animals were fond of it.

Orroroo, February 2.

Present—Messrs. J. Moody (Chairman), W. S. Lillecrapp, J. Jamieson, S. Roberts, W. H. Roberts, M. Oppermann, E. Copley, and T. H. P. Tapscott (Hon. Sec.).

WHEAT EXPERIMENTS.—The Hon. Secretary read paragraph from local paper dealing with results of shipping wheat, &c., through the South Australian Farmers' Co-operative Union. He also tabled samples of Petatz Surprise, Indian King, and Bartlett's Crossbred wheats. The two latter were grown from seed received from Central Bureau. Though the samples were rather pinched, owing to continuous dry weather and damage by the locusts, he believed both varieties would be very suitable for this district. Petatz Surprise wheat was badly damaged by the locusts, and the grain was very pinched.

Murray Bridge, February 10.

Present—Messrs. F. Wurm (Chairman), W. Lehmann, J. J. Stecker, H. Schubert, J. G. Jaensch, Jno. Cowan, A. A. Kutzer, and R. Edwards (Hon. Sec.).

MANURING AND FALLOWING.—Mr. Lehmann read the following paper on "How to grow Good Crops with Artificial Manures in Dry Districts":—

To grow good crops of wheat in districts with a rainfall of 12in. to 14in. has become somewhat difficult under the old style of cultivation, but nevertheless it is possible to produce heavy crops with the aid of artificial manures under the most improved system of cultivation. This has been proven beyond a doubt in other parts of the world; for instance, in parts of America where the rainfall only averages about 12in., good crops have been grown by fallowing to a depth of 12in., thereby conserving more moisture than by ploughing only from 4in. to 6in. Of course there are soils which are not altogether a success when fallowed and drilled in with artificial manures, such as clay, ashy, or heavy loam that will not absorb or retain moisture so readily as deep sandy soils; these soils, in my opinion, would require extra treatment. Our best mode of cultivation so far has been to fallow early to a depth of 4in. to 7in. Fallowing early ensures everything rotting that you may plough under, such as straw, grass, manure, or growing weeds, which will then be available as plant food when you put in your crop; early fallowing will also cause a greater proportion of weeds to germinate, which then can be destroyed by scarifying; scarifying and harrowing causes the moisture to be retained in the soil.

When seeding time arrives your fallowed land is in first-class order to readily absorb all early rains that may fall. You will have observed that deep sandy soils have grown the finest crops of wheat with artificial manures, because such will absorb moisture readily, the rains penetrating well into the subsoil and on account of its loose nature and fineness this moisture is retained, and the roots of the wheat plant easily penetrate to the moist layers of soil You will also have observed that drilling in artificial manures on other than sandy soils the wheat plant seems to receive a check when dry weather sets in, no doubt partly on account of the manure being drilled into the soil in a thin streak, causing the roots to concentrate about this layer of manure and absorb all moisture around it before the next rain fell. The roots then have to penetrate the tough subsoil of the moisture, perhaps without obtaining any benefit from the manure at the time; hence this check. Then why not try to prepare all soils to closely resemble sandy soils by fallowing about 5in deep and subsoiling another 7in, thereby conserving the necessary moisture.

Now I suggest that experiments be made to overcome those temporary failures in the supply of moisture whilst the plant is in its growing and filling grain stage by fallowing and subsoiling as before mentioned, but to drill in with the subsoil a certain quantity of non-heating or slow-acting manure such as Thomas phosphate, guano, guano super., bonedust. These manures become available when the wheat plant would be drawing moisture from the subsoil; this would give the plant the required moisture with the manure, combined just at a time when the plant required it.

One serious objection to drilling in a sufficient quantity of artificial manure with the seed to a depth of 2in. to 4in. is that all the manure being close to the grain it starts a strong luxuriant growth which it cannot later on maintain; but should the seed be drilled in with a small quantity of manure, sufficient to start the crop well, the quantity drilled into the subsoil would support the plant in a more even and sure growth.

Woodside, February 12.

Present—Messrs. R. Caldwell, M.P. (Chairman), R. W. Kleinschmidt, F. W. Drogemuller, A. Lorimer, C. W. Fowler, A. Pfeiffer, R. P. Keddie, G. F. Lauterbach (Hon. Sec.), and two visitors.

STRATHALBYN CONFERENCE.—The Chairman promised to prepare a paper for the Annual Conference of Southern Branches to be held at Strathalbyn on March 29, and several members promised to attend.

MEMBERSHIP.—It was decided that the rule *re* non-attendance of members be strictly enforced.

Meningie, February 10.

Present—Messrs. M. Linn (Chairman), D. Roberts, W. J. Botten, S. F. Robinson, A. J. Myren, J. Williams, H. May, and H. B. Hacket (Hon. Sec.).

OFFICERS.—Messrs. M. Linn, Jabez Williams, and H. B. Hacket were re-elected Chairman, Vice-chairman, and Honorary Secretary respectively for ensuing year.

CONFERENCE.—Several members promised to attend Conference of Branches to be held at Strathalbyn on March 29.

EXPORT OF BUTTER.—It was resolved that this Branch, believing that the action taken by the Minister of Agriculture in regard to grading and branding of butter for export is in the best interests of the producers, leaves the matter, as brought forward at previous meeting, in abeyance.

MANURING.—It was decided to inquire as to best means of obtaining the use of a seed and fertiliser drill for use in the district for experimental work.

ONIONS.—Mr. May tabled fine onions grown by himself by aid of irrigation. One weighed over 2lbs., and he had about 2cwts. of onions that would average 1½lbs. each. Members considered the samples equal to any they had previously seen.

SEASON.—Rainfall recorded for 1899, 18·76in., compared with 17·62in. in 1898 and 12·38in. in 1897. Many portions of the district, however, appear as though they had less rain last year than in 1897 owing to the dry and drifting character of the soil, comparatively firm land suffering also. Some residents consider that the rains in November and December last year laid the grass down, and, being followed by heavy winds, has caused the extra arid appearance of the lakes districts.

Mount Remarkable, February 8.

Present—Messrs. C. E. Jorgensen (Chairman), W. Lange, G. Yates, T. P. Yates, J. B. Murrill, D. Roper, and T. H. Casley (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year eleven meetings had been held, with an average attendance of eight members. On three occasions only had visitors been present. Three papers had been read, and many practical matters discussed. Seed experiments had not been a success owing chiefly to late frosts and ravages of grasshoppers. Bartlett's Crossbred wheat was considered a suitable variety for the district, but Indian King was a failure. Dart's Imperial wheat, received three years previously, had given good results with Messrs. Lange and Casley. From the produce of a few grains received in 1897 both members this year have enough to sow 100 acres. The annual Congress in Adelaide was attended by two members of the Branch. The Jersey bull Laddie Warwick had been loaned to the Branch by the Department, and it was hoped that the farmers would utilise his services.

Strathalbyn, January 22.

Present—Messrs. M. Rankine (Chairman). H. H. Butler, W. J. Tucker A. Rankine, R. Watt, and J. Cheriton (Hon. Sec.).

CONFERENCE.—It was decided that the eighth annual Conference of Southern Branches be held at Strathalbyn on March 29.

MANURES.—The Chairman gave detailed report on experiments with manures. Seven pounds sulphate ammonia and 50lbs. super. were used on one plot; 5lbs. sulphate ammonia and 50lbs. super. on No 2; 5lbs potash and 50lbs. super. on No. 3; 5lbs. sulphate ammonia and 50lbs. super. on No. 4; 7lbs. potash and 50lbs. super. on No. 5; and 5lbs. potash, 4lbs. ammonia, and 35lbs. super. on No. 6. The returns in every case were very satisfactory, the best being from plot receiving the most potash. He considered his land and similar land in this district to be deficient in potash. Potash was also a most important manure for potato crops. Mr. Tucker got little return from Kangaroo brand guano; other members reported similarly. Mr. Watt had very satisfactory results from use of bonedust. Members fully indorsed the beneficial effect resulting from the use of suitable fertilisers, and emphasised the necessity for farmers carrying out experiments to ascertain those most suitable for their soils.

Penola, February 10.

Present—Messrs. A. E Stoney (Chairman), E. McBain, D. McKay, W. Miller, J. T. Morris, T. H. Morris, Dr. Ockley, and R. Fowler (Hon. Sec.).

WOOL-SORTING.—It was decided to endeavor to form a wool-sorting class in this district

APPLES.—The Chairman tabled sample of apples for identification. They were of good quality, and had been ripe for the past two weeks, Stock Complaints.—Mr. McKay asked whether members had any experience with lambs suffering from sore mouths at this time of the year. He had a number affected, but he had never seen grown sheep affected. He used a mixture of equal parts Stockholm tar and fat, well rubbed in, and cured the trouble in three or four days. Mr. T. H. Morris mentioned that his lambs were only affected when they were running in paddocks in which milk-thistles were growing. The Chairman asked if any member had tried alum for diarrhœa in horses. Mr. McKay recommended chilled water and flour.

Strathalbyn, February 12.

Present—Messrs. M. Rankine (Chairman), Hon. J. L. Stirling, M.L.C., W. J. Tucker, H. H. Butler, A. Rankine, R. Watt, W. M. Rankine, D. Gooch, P. Cockburn, and J. Cheriton (Hon. Sec.).

Conference.—Arrangements in connection with Conference of Southern Branches, to be held on March 29, were considered.

Bunt.—Discussion took place on most effectual means for preventing injury from bunt in the wheat crops. Members were agreed that the bluestone pickle, if properly applied, was a certain preventive.

Wool-classing.—Mr. G. Jeffrey, from the School of Mines, gave a very interesting lecture on "Wool-classing" to a large audience, and sixteen names were handed in to join classes in wool-classing to be started at Strathalbyn.

Wilmington, February 15.

Present—Messrs. J. Hutchens (in chair), J. Hannagan, J. Zimmermann, T. H. Harris, R. Cole, M. Gray, J. McLeod, A. Paull, J. Schuppan, J. Lauterbach, W. Slee, T. Carter, sen., and R. G. S. Payne (Hon. Sec.).

Duck-breeding.—Mr. Paull read a paper on this subject, of which the following is the substance:—

Very few farmers recognise the fact that duck-breeding is a paying industry, and will bring in more money than the raising of any other kind of poultry. Some when spoken to say, "I can't go in for breeding ducks, as I have so little water," and many others make the same mistake, thinking that a large supply of water for duck-breeding is a *sine qua non*. I have bred ducks successfully in a back yard 18ft. x 24ft., and where the water was shut off from the hour of 8 a.m. up to 6 p.m., and I conclude that if such good results could be met with in such a very limited space, how much more so on a farm with plenty of good feeding ground

Breeds.—There are many; but my choice is the Aylesbury, as they are good layers, as well as good table birds. The Pekin is a similar bird, and perhaps the larger of the two. In rearing, great care must be exercised for the first ten days. The best plan is to take them away from the hatching bird at once, and confine them in a nice snug place. If you are going to raise for market purposes, keep them shut up and feed mostly with soft food, such as pollard, mixed with waste bits from the table, and let them have sufficient water for drinking purposes only. If you intend them for breeding purposes, at the end of that time you can let them out with the other poultry. If for market purposes, and fed on bran, pollard, curds, and skim milk, then at from five to ten weeks they will bring in from 10d. to 1s. each. A duck if well fed (as on a farm) will lay over 200 eggs in a season, and these will always command 1d. per dozen over hen eggs.

Use on Farm.—It cannot be over-estimated the value to the farmer of a number of ducks moving over the land in the winter and spring. They feed largely upon insects, grubs, worms, etc., which might do serious damage to the young growth, and though they might eat a little wheat at times, they more than compensate for this by killing greater destroyers. Farmers say, "They spoil the water in the dams." Well, if they earn so much money, then it would pay to fence in the dams with wire netting, and have an entrance gate also wire netted. To the small or large farmer I say raise more ducks than other poultry, as they will pay you bigger money. Give them a trial, either for eggs or export; they will pay better than any other poultry.

RABBIT POISONING.—Mr. Gray initiated a discussion on the use of phosphorised pollard for rabbit poisoning. Several members reported on the satisfactory results from use of phosphorised pollard, and the freedom from danger if ordinary care is exercised was emphasised. Mr. Gray stated that he prepared the mixture in the following way:—Have a gallon of water in a suitable vessel over a good fire, put in 6lbs. sugar and stir well to thoroughly dissolve it, then while the water is boiling add 1½ sticks of phosphorus, and keep stirring until all is dissolved. The water must not be allowed to go off the boil. Now add, slowly, the pollard, keeping it stirred all the time with a flat stick, and when it is thoroughly mixed remove from the fire and allow it to cool; 14lbs. pollard will be required, and will make a thick substance. When putting the mixture away in a safe place sprinkle it with dry pollard to prevent the fumes escaping. When quite cool it may be handled safely and moulded into a good stiff paste. Make it up into pellets about the size of a small marble, and distribute them thinly about the land.

POTATOES.—Mr. Gray asked what time seed potatoes from Mount Gambier should be planted in this district. He put some in in August and they all went to top. The Hon. Secretary said it would depend on the soil and situation. Mr. Gray's land was a rich vegetable loam with an abundant soakage from the adjacent hills, and here October was quite early enough to plant, whereas on the plains August would perhaps be the best time.

Gumeracha, February 12.

Present—Messrs. W. A. Lee (Chairman), S. Gent, H. G. Kramer, J. Monfries, A. E. Lee, and D. Hanna.

OFFICERS.—Dr. Nicholls tendered his resignation as he was leaving the district. Messrs. D. Hanna and S. Gent were elected Chairman and Vice-chairman respectively. Mr. W. A. Lee agreed to act as Hon. Secretary for a time.

Maitland, February 3.

Present—Messrs. H. R. Wundersitz (Chairman), W. Wilson, A. Jarrett, J. Hill, H. Bawden, and J. S. McLeod.

WOOL-CLASSING.—It was decided to endeavor to arrange for lecture on wool-classing by Mr. G. Jeffrey, of the School of Mines.

BUNT.—It was decided to take no action in regard to analysis of bluestone, as no fault could be found with the material sold in this district, it being manufactured by the Wallaroo Smelting Company. It was decided that the subject for discussion at next meeting be bunt. This trouble has been very prevalent during the past season.

Bakara, February 15.

Present—Messrs. R. Wilson (in chair), A. Tiedel, E. Wall, R. Barrow, A. Hermann, T. Hermann, F. C. H. Martens, and one visitor.

SEEDING.—A good discussion took place on seeding operations. Members were of opinion that all straw and rubbish should be burned off the land previous to seeding, and that all ploughed land should be worked down smooth. The disc-harrow was favored for covering the seed in sandy soil; the seed drill was also recommended, but members did not consider they would require to apply manure for several years yet. [Keep the land in good heart; do not wait until it is impoverished before returning some of the plant food taken out by the crop.—GEN. SEC.] Half a bushel of wheat was generally considered sufficient to sow an acre. Dart's Imperial and Purple Straw wheat were most suitable for early sowing, and Steinwedel and Early Para for late sowing in this district. It was agreed that seeding should be finished about the middle of May.

Watervale, February 6.

Present—Messrs. C. A. Sobels (Chairman), L. Buring, H. Beck, S. Solly, G. Hunter, H. Scovell, and E. Treloar (Hon. Sec.).

BIRD PESTS.—Members reported that the starlings are very numerous throughout the district and are doing great damage to soft fruits, especially grapes. About four years ago starlings were quite rare in this district. Members were of opinion that the district councils should buy heads and eggs the same as for sparrows as they are a much worse pest. Mr. Hunter stated that the sparrows had been destroying his beans and other vegetables and were a great nuisance. He used poisoned wheat, killing some and had apparently frightened the others away.

FRUIT CROP.—Members reported the crop to be very light with the exception of apples. In some of the gardens the trees are in very bad condition.

Bowhill, February 14.

Present—Messrs. W. G. F. Plummer (Chairman), A. Groth, A. Dohnt, jun., W. Towill, G. Knight, J. Gregory, J. MacGlashan, J. Walters, and H. H. Plummer (Hon. Sec.).

OFFICERS.—Mr. H. H. Plummer tendered his resignation as Hon. Secretary, as he was leaving the district. Regret was expressed at the loss of Mr. Plummer, who has acted as Hon. Secretary for the past five years. Mr. A. Groth was appointed to the vacant position.

BLUESTONE AND BUNT.—Members considered the action taken by the Central Bureau to test the qualities of the bluestone sold throughout the country districts most important, though as far as this district is concerned they had no complaint to make.

STOCK COMPLAINT.—Mr. Towill urged the necessity for care in the treatment of ailing stock. Too often the owner would consult almost anyone that happened to come along, with the result that the animal was drenched with physic and done more harm than good. Mr. Gregory agreed, and thought it better to give small doses of medicine at first, gradually increasing the quantity. He had recently lost a calf quite suddenly. It was fed on skimmed milk, and one morning he heard it making a noise and a little later found it dead He at first thought it was snakebite, but on examination found the animal distended with gas. Mr. Towill attributed the loss to flatulent colic, and advised giving four drops nux vomica, or more with a large calf, on first signs of the trouble.

STANDARD SAMPLE OF WHEAT.—The Chairman initiated a discussion on this subject by reading report from *Journal of Agriculture.* There was no doubt a sample going 65lbs. per bushel would command a better price in London than one going only 63lbs., and it was to the benefit of the farmer to have a high standard. He believed the wheat grown in the North generally would be heavier than in the South and cooler districts. Mr. Towill thought there could be little doubt that the sample sent home as the standard for the season was a disgrace to the colony, and he agreed with Professor Lowrie's contentions. It was to the farmers' interest to send good samples in to the Chamber of

Commerce when the standard was being fixed. Mr. Gregory considered that some of those who sent in samples to the Chamber were very greatly to blame. If bunt and weed seeds were prevalent in the sample it was very evident that something not a fair average of the season's wheat had been sent in, and if any buyer would accept such at market price it did not say much for his qualifications.

RABBIT EXTERMINATION.—Mr. Knight read a paper on this subject. Now was the time for one and all to make a united effort to exterminate the pest from their holdings. Many farmers distribute phosphorised pollard when compelled by law to do something This is not sufficient, as the poison should be laid all round the paddock three or four times during the season. Every rabbit missed means perhaps twenty to eat the crop when it is above ground. One may do all in his power to get rid of them, but if his neighbors go to work in a half-hearted way his efforts are practically useless. If landowners would only look at the matter in the proper light there would be no necessity to appoint inspectors to see that the law was carried out, while the money paid for inspection would meet the cost of destroying a lot of the rabbits on the waste Crown lands in the district. He found the best way to poison the rabbits was to plough a furrow, distribute the pollard along it, and then fill up all burrows. Members generally agreed with Mr. Knight. Mr. MacGlashan advised changing the poison occasionally. First use phosphorus and pollard, then, later on, substitute wheat soaked in strychnine. Mr. Dohnt found mixture of arsenic and pollard distributed first, then the phosphorised pollard, gave best results. Members agreed as to change of poisons being beneficial. Phosphorised pollard placed on the pads, and in close proximity to the warrens, has been most effectual. The difficulty of unoccupied Crown lands, where the rabbits were allowed to breed unchecked, was referred to by Mr. MacGlashan. Directly feed becomes scarce they come down to the river frontages and destroy the crops and feed. Some action for simultaneous destruction of the rabbits on Crown lands was necessary.

Richman's Creek, February 12.

Present—Messrs. W. Freebairn (Chairman), A. Knauerhase, E. Roberts, J. McSkimming, J. A. Knox, P. J. O'Donohue, J. J. Searle, W. J. Wright, F. Mattner, J. J. Gebert, A. Nicholson, J. M. Kelly, J. McColl (Hon. Sec.), and two visitors.

CULTIVATION OF WHEAT.—The Hon. Secretary read a paper on this subject, which he also promised to read at the Quorn Conference.

ADELAIDE SHOW.—Messrs. W. Freebairn and A. Knauerhase were appointed to report on machinery, &c., at the Adelaide Show.

RAINFALL.—For twelve months ending December 31, 1899—Recorded by W. Freebairn, 9·36in.; by Messrs. McColl, 12·30in.

Yorketown, February 10.

Present—Messrs. J. Koth (Chairman), A. Jung, G. Bull, C. Domaschenz, and J. Davey (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Domaschenz reported that he obtained 8bush. per acre last season from Petatz Surprise wheat, as compared with only 5bush. from the rest of the crop sown at same time.

STOCK COMLAINTS.—Members reported a few cattle to be suffering from indigestion; otherwise stock were doing fairly well. [Where signs of indigestion appear steps should be at once taken to relieve it, otherwise serious results may follow.—GEN. SEC.]

Colton, February 10.

Present—Messrs. P. P. Kenny (Chairman), W. J. Packer, Jno. Shepard, M. S. W. Kenny, J. L. Higgins, E. Whitehead. B. A. McCaffrey, G. Mayers, and R. Hull (Hon. Sec.).

Wheat Experiments.—Two members reported that their experiments with Bartlett's Cross-bred and Indian King wheats had not been a success, the very dry weather and severe frost having done them considerable damage. Mr. M. S. W. Kenny read the following paper on "Sowing Wheat," giving results of his operations for past three seasons:—

In 1897, 200 acres sown and cultivated were ploughed with a Smith's four-furrow plough, put in with a Massey-Harris cultivator and four light horses. Started to sow on March 22 and finished April 19. Sowed 164bush. and reaped 1,620bush. This was one of the best crops in this district, and I considered it was twice as good as the crop adjoining, which was ploughed and sown in the usual style. In 1898, 250 acres new scrub land were ploughed up with the same plough. Started ploughing February 14 and finished April 14; started sowing April 16 and finished the 250 acres on May 19 with the Massey-Harris cultivator. Sowed 160bush. wheat, cut 30 acres for hay, and reaped 450 bags wheat. The cultivator made good work in the scrub land. This work was all done by one man. In 1899 sowed with the same cultivator and four light horses 720 acres, all rough land. Sowed 480bush. wheat, cut fifty, acres for hay, and reaped 1,050 bags wheat from 670 acres. Started sowing March 22 and finished June 8. This land was all cultivated by one young boy, who pickled all the seed and also carted it out to the paddock. This is a correct statement of the three years' wheat-growing, and I will leave it to the members to decide if my style of sowing wheat is as good as other methods adopted in this district.

Mr. Higgins said his experience was in favor of broadcasting the seed on their light, sandy, loamy soils, which were too dry for manures to pay to apply. He believed in harrowing the wheat when about 3in. high, and last season, having to go to Adelaide on business, he instructed his man to harrow some of the crop. This was partly done, but as the man thought he was pulling nearly all the wheat up, Mrs. Higgins instructed him to discontinue the work. When the crop was harvested the portion harrowed gave at least 5bush. per acre more than the other part untreated. Some discussion also took place on the use of the seed and manure drill. Mr. Higgins said the district was too dry, but the Chairman stated he had got good results from wheat drilled in with manure, and he was so satisfied that he had purchased a drill and 5 tons of manure for the coming seeding. It was finally agreed by the majority that the seed and fertiliser drill was the right thing for the district. It was agreed that Steinwedel was the best early wheat, and that sixty to eighty acres of this variety should be sown for each reaping-machine. Of the other varieties, Purple Straw, Big Purple Straw, Little Purple Straw, and Lammas were favored.

Wool-classing.—Mr. Whitehead tabled samples of wool, and explained the characteristics of same. Mr. Higgins considered the samples very good, and thought wool should be one of the principal staples of the district. Farmers should give every attention to their sheep, and continue to improve both the quality and quantity of wool produced. It was decided to endeavor to arrange for visit by Mr. G. Jeffrey, lecturer on wool-classing, and to ask other Branches on the West Coast to co-operate.

Lucindale, February 19.

Present—Messrs. E. Feuerheerdt (Chairman), L. McInnes, E. Hall, A. Dow, J. Bourne, H. Langberg, B. A. Feuerheerdt, G. Newman, A. Carmichael, A. Matheson, G. Humphries, J. Riddoch, and E. E. Dutton (Hon. Sec.).

Conference.—Matters in connection with Annual Conference of South-Eastern Branches, to be held at Lucindale on March 15, were dealt with. The Hon. Secretary reported that the General Secretary and Messrs. G. Quinn and G. Jeffrey had promised to attend, and the latter would give a paper on Wool-classing.

Cattle Complaint.—Mr. Hall stated that several cattle had died recently, and some were still ill suffering from some complaint. They frothed at the mouth a good deal, and appeared weak in the loins

Farming.—Mr. Langberg read the following paper :—

The present time of the year is a fitting one to say something about our past and future farming. In the first place, dealing with last year's harvest, we all know that it was not satisfactory. What is the reason and what is the remedy? The reason is partly over-cropping, and exhaustion of the soil. To crop land beginning to show signs of exhaustion is a waste of time, labor, money, and seed; things will only get from bad to worse. The crops will be lighter and lighter every year, until the soil becomes so impoverished that cultivation has to be abandoned, it will not even grow grass. Thousands of acres are in this condition now, and thousands of acres are undergoing the same exhausting process. It is time something was done to remedy this state of things. The land laws are responsible, to a very large extent, for the system—or want of system—that farmers previously have adopted, as farmers, as soon as they had exhausted their selections, could move on and take up land in another part of the colony and continue the same old game of wearing out the land. The business of farming prospered so long as there was plenty of virgin soil to be obtained. A few years ago most farmers were driven to try some other mode of making their crops grow, as they would scarcely return seed, by trying different fertilisers ; but even this is not so satisfactory as it should be. Farmers should pay the same attention to farming as business men find it necessary to do to their business; but in a great many instances they have not the knowledge of the scientific side of farming that they ought to possess. It is of this very want of this knowledge that causes farmers to make mistakes in using manures. When harvesting you can see at a glance what particular part of a field requires the most assistance from some kind of fertiliser; wherever the crop is light, depend upon it there is a deficiency in the soil of plant food for that particular crop. These weak places should be noted, and some line of future a tion decided upon for the purpose of restoring fertility before any more crops are put in. The next thing, therefore, to consider is the changes the soil undergoes in providing for the growth of plants. No farmer can have a proper knowledge of the principles of manuring unless he first understands which plant draws the heaviest on the soil for its sustenance, and what particular kind of fertiliser it thrives best on. Then, too, unless the tillage is equally good, the best fertilisers available will not cause the crops to be a success.

Mr. Carmichael would have liked Mr. Langberg to have gone a little further and told them what manures he would advise using for the different crops. Mr. Riddoch said he had applied 2cwts. of bonedust per acre on five acres of land every other year, and got at the rate of 20bush. Algerian oats per acre. He afterwards gave it the same dressing every year, and the average returns were doubled. He considered bonedust gave excellent returns if used freely. He also thought much of their trouble with stock complaints were due to innutritious feed, and if stock-keepers would only grow succulent grasses for their stock they would have little trouble. He had had indifferent success in this district with lucern, though it did well in Penola district. Members thought the lucern roots reached water level or the pipeclay, and, as there was no good subsoil above, it would not stand feeding. Mr. Carmichael recommended Yorkshire Fog grass for pasture, while Mr. McInnes advised sowing Johnson grass on sandy soil. Mr. Langberg stated he had used 2cwts. of bonedust per acre on his crops without any result.

Cherry Gardens, February 13.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, C. Lewis, J. Mackereth, G. Brumby, A. Broadbent, G. Hicks, J. Metcalf, and C. Ricks (Hon. Sec.).

"Smutty" Chaff.—Mr. Brumby asked whether chaff made from "smutty" hay would be injurious to horses. Members had no experience on this point, but would like to hear from other Branches.

Manuring.—Mr. C. Lewis reported that he obtained 24bush. of wheat per acre from land dressed with 3cwts. Thomas phosphate per acre. The land was nearly worn out, and would not, he thought, produce more than 8bush. per acre without manure.

FRUIT-CULTURE.—Mr. Gibbins read a paper on fruit-culture for this district to the following effect:—

He believed that this district had a great advantage over most other districts in regard to fruit-production, and in view of the low prices obtained for dairy produce, hay, and vegetables, he thought it well worth serious consideration whether they should not go in more largely for fruit-growing, and put to use land which for soil and situation would be hard to beat, but which at present is comparatively useless, producing only whitegum and stringybark trees. That fruit trees will both grow and bear well they had a number of instances in small isolated gardens, where suitable varieties had been planted. There were hundreds of acres of land in this district which would produce equally good results with proper care and attention. He believed that all good fruit of a suitable character for carriage that they could produce could be profitably disposed of at Broken Hill, Western Australia, and elsewhere. Surely when they could produce fruit without any expense for irrigation they should be able to compete with the fruit colonies, where the expense for pumping water, making channels, &c., was so heavy. He thought they could reasonably expect for some years to come fairly good prices for good fruit. Of course great care was necessary to select only trees suitable to the locality and of the right kind. In various parts apples, pears, apricots, quinces, plums, cherries, &c., will do splendidly, while peaches and nectarines, which generally command remunerative prices, will also do well in a good many parts.

Wilson, February 17.

Present—Messrs. W. H. Neal (in chair), T. Barnes, R. Rowe, H. Need, H. T. Crossman, T. Matthews, A. Crossman, A. Canning (Hon. Sec.), and one visitor.

FOWL TICK.—Mr. Matthews asked for cure for fowl tick, and the Hon. Secretary pointed out that the cure had been frequently given in the poultry notes in *Journal of Agriculture.*

CONFERENCE.—Messrs. Neal and Rowe gave interesting reports of the proceedings of the Conference of the Far Northern Branches, held at Quorn on the previous day.

Gawler River, February 16.

Present—Messrs. A. M. Dawkins (Chairman), J. S. McLean, J. Badman, R. Badcock, J. Hillier, H. Heaslip, D. Humphries, J. Drinkwater, A. Bray, F. Roediger, H. Roediger (Hon. Sec.), and five visitors.

STANDARD SAMPLE OF WHEAT.—The Hon. Secretary tabled standard sample of wheat from Chamber of Commerce. It was considered inferior to the wheat produced in this district, and members expressed the opinion that bunted wheat should not have been mixed with the bulk when fixing the standard, as buyers would not purchase such wheat at full market price.

STOCK COMPLAINTS.—The Hon. Secretary stated that he had been informed that wood ashes in the drinking water had cured fowls suffering from similar trouble to those referred to at previous meeting by Mr. Humphries. The Chairman reported having a horse affected by sand. He gave it a dose of raw linseed oil, which fetched away the sand, but the horse's head was very much swollen, and he would like to know whether impurities in the oil would be likely to cause this. Several members recommended giving horses crushed linseed in bran and chaff for three or four days at this season of the year, to prevent the accumulation of sand. Mr. McLean reported having lost a number of young pigs from a disease quite strange to him. The parents were healthy, and the young seem to do well and grow all right, until four or five weeks old. The first symptom of trouble is that the pigs stagger and fall about, apparently recover for a short time, but again become affected, and walk about with their heads all on a twist. They gradually waste away, and all over the stomach, down the legs, and on the nostrils the skin becomes of a purple-red color, as though there was an overflow of blood. When cut open, the pigs were found to be almost bloodless, the heart, lungs, and intestines appearing quite healthy, except that the lining of the entrails are streaked with lines of blood.

SEED EXPERIMENTS.—Mr. F. Roediger tabled fine yellow fruited tomato, King Humbert, grown from Bureau seed. The plant was a strong grower, and very prolific, the fruit being of good flavor. Members considered that the color would prevent the variety being useful for market.

Forest Range, February 15.

Present—Messrs. J. T. Rogers (Chairman), A. Green, W. Cherryman, O. Kumnick, H. Waters, C. Stafford, and J. Caldwell (Hon. Sec.).

SEED EXPERIMENTS.—Mr. Caldwell reported that Mammoth pumpkins and watermelons were growing luxuriantly. Mr. Waters reported good results from Kaffir corn. Several members failed to get the seeds to germinate. Mr. Green found that seed potatoes from Circular Head gave better results than those from Mount Gambier. Some discussion ensued on potato-cultivation.

PEACHES.—A discussion took place on growing peaches. Mr. Waters found they did well with him in good moist soil. Mr. Green advised vigorous pruning, as the trees must have plenty of young wood each year, or the results will not be satisfactory.

VERMIN.—Mr. Waters reported that kangaroo rats were doing a lot of damage to his potatoes, rooting up the soil and eating the tubers, and he would like to know how to deal with the pest. He had tried Paris green on peas, but this seemed to give no results. Mr. Stafford thought it was more likely to be "pinkies" than kangaroo rats causing the trouble Rabbits are reported to be on the increase in the district, and doing considerable damage to young fruit trees. Mr. Rogers recommended wire-netting the orchard; the netting should be 2ft. 6in. wide, with 6in. laid flat on the ground and covered with earth to prevent the rabbits burrowing under. Several successes by poisoning apples with arsenic were reported, but members considered this method too dangerous to be recommended.

Clare, February 8.

Present—Messrs. J. Christison (Chairman), H. Carter, C. J. McCarthy, G. Lloyd, J. T. Hague, H. Miller, and J. H Yelland (Hon. Sec.).

PICKLING WHEAT.—A lengthy discussion on this subject took place. All members who had used bluestone last season were of opinion that it was not as good as it should be. Mr. Carter said generally 8ozs. of bluestone to the bag of wheat was used; at that strength, however, great care must be exercised. Pickling on the floor was favored in preference to dipping the seed in a standard solution. Mr. Carter stated that he had seen wheat pickled in the following way. A redgum trough 10ft. to 12ft. long, 18in. deep, and 12in. wide was used, one end being covered over and the other left open. No iron should be used where it is likely to be corroded by the bluestone. The open end was raised to the height of the depth of the trough; the lower end was half filled with the standard solution of bluestone, the seed wheat put into pickle, and then withdrawn upwards through the liquid by a board to the top end, allowing the pickle to drain back. The wheat may be drawn over the end direct into bags, or put away to drain and dry thoroughly. Members considered this an excellent method for treating large quantities of seed, being rapid and efficient.

Manuring.—Fertilisers are now considered practically indispensable in this district if a first-class crop is to be produced. Mr. Carter stated that last season when putting in his crop with the seed and fertiliser drill he used super. at rate of 80lbs. per acre on three rounds, then 160lbs. guano per acre the next three, then super. again, followed by a lot unmanured. The result was noticeable in the crop a long distance off. Super. gave the best results, being closely followed by the guano; but there being double the quantity of the latter there was twice the labor in filling and twice the waste. The unmanured portion was very inferior to the rest. The Hon. Secretary tabled results of experiments with manures at the Clare Agricultural School.

Lot.	Return at per Acre.		Chaff and Waste per Acre.	Straw per Acre.	Manure Applied.
	Hay.	Wheat.			
	Tons.	Bush.	Lbs.	Lbs.	
1....	1·42	15	100	1,000	Nil.
2....	1·44	19	460	2,000	120lbs. per acre each muriate potash and nitrate of soda.
3....	1·93	26	600	2,625	400lbs. per acre Thomas phosphate in addition to No. 2.
4....	1·62	20	480	2,250	400lbs. Thomas phosphate and 120lbs. muriate potash.
5....	2·32	25·3	300	3,000	400lbs. Thomas phosphate and 120lbs. nitrate soda.
6....	3·48	26·6	680	4,750	Same as No. 3.
7....	1·59	11·1	83	1,500	Nil.

Nos. 1 and 7 were hand threshed, hence the small amount of waste; and the 100lbs. in No 1 and 83lbs. in No. 7 represents pure chaff. Nos. 2, 3, 4, 5, and 6 were put through the header and winnower. No lime was added to any of these plots. Nos. 1 to 5 were broadcasted and Nos. 6 and 7 drilled in. Purple Straw wheat was sown in all the plots. Plots in each case, except No. 7, were one-tenth of an acre in area, half being cut for hay and half left for wheat. The grain portion of No. 7 was 300 square links in area.

Members were of opinion that the experiments would have been of more value if different kinds of manure had been used and in smaller quantities. The Hon. Secretary reported that the experiments were conducted according to the instruction of the donor of the fertilisers used.

Lucern.—Although this is considered the best crop for summer fodder, only indifferent success has been achieved in this district. The general opinion is that the land sets too hard, but one member pointed out that with him it had germinated best on the head lands of the paddock where the soil was firmed most, and the plant had also grown better here. After the plant has got a good hold, the more the soil is worked the better the results. The first year the plant should be cut or fed quickly by cattle in preference to sheep.

Naracoorte, February 10.

Present—Messrs. S. Schinckel (Chairman), J. Wyne, O. Hunt, G. Wardle, and G. Greenham (Hon. Sec.).

Conference.—Various matters in connection with the annual Conference of South-Eastern Branches, to be held at Lucindale, on March 15, were dealt with.

Codlin Moth.—The General Secretary wrote, stating that the Inspector of Fruit had advised Mr. Spencer Williams to make a careful examination of the gardens of Naracoorte for codlin moth, to instruct the owners of infected gardens as to the preventive measures to be taken, and to submit list of gardens to the local police, and to the office. The police will be advised as to what the owners have to do in their gardens, and will be asked to pay an occasional visit of inspection to see what work was being done. Mr. Williams would also visit Naracoorte at least once a month, and if the regulations were not properly observed the owners of the gardens would be proceeded against. It was impossible for the Department to provide a paid inspector for Naracoorte, but the opinion was expressed that the provision made should be sufficient to secure that every care was taken to check the spread of the pest. However, in their own interests, the members of the Branch should bring under the notice of the police any breaches of the regulations, especially those dealing with the disposal of infected fruit. Mr. Hunt said he had inspected one of the worst infested gardens in the township since last meeting, and found it very bad. The owner had expressed himself as alive to the situation.

HARVEST.—Some discussion took place on the harvest. The returns on the whole were not so good as in the previous year.

Balaklava, February 10.

Present—Messrs. P. Anderson (Chairman), A. Manley, J. Vivian. W. H. Thompson, W. Smith, J. Crawford, and E. M. Sage (Hon. Sec.).

MANURES.—The Hon. Secretary tabled reports of experiments with fertilisers carried out by Mr. C. N. Grenfell, at the Mount Templeton public school.

Results of Sowing Wheat with 200lbs. of Different Fertilisers.

Kind of Fertiliser.	Name, &c.	Date of Sowing.	Average Yield per Acre.		Notes taken on Oct. 28th, 1899.
		1899.	Bush.	lbs.	
Phospho-guano	Gibbs, Bright. & Co.	June 6	17	6	Very fair.
Eng. superphosphate	Globe S. A. F. U. (1898)	May 27	15	34	Good.
Eng. superphosphate	Globe S. A. F. U. (1899)	" 27	14	26	Very good.
Eng. superphosphate	"Lawes"	" 27	13	52	Good.
Eng. super. and wood ash, equal parts	From year 1898	" 27	12	3	Fair.
Super-guano..............	1899	" 27	10	57	Fairly good.
Super-guano..............	1898	" 27	10	30	Fairly good.
Thomas phosphate	1898	" 27	3	7	
Nitrate of soda	1899	" 29	2	46	Poor.
Muriate of potash	1899	" 29	2	35	Poor.
Bonedust	Broken Hill (1898)	" 27	2	17	Poor.

Results of Sowing Wheat with Different Quantities of Various Manures.

Kind of Manure.	Quantity Used per Acre.	Date of Sowing.	Average Yield per Acre.		Notes taken on Oct. 28th, 1899.
	Lbs.	1899.	Bush.	lbs.	
Eng. super., "Globe"	300	May 30	12	27	Good.
Muriate of potash	100				
Nitrate of soda	100				
Eng. super., "Lawes"	300	" 30	10	47	Good.
Muriate of potash	100				
Nitrate of soda	100				
Eng. super., "Lawes"	50	" 27	8	12	Good.
Thomas phosphate	300	" 30	3	10	
Muriate of potash	100				
Nitrate of soda	100				
Kangaroo brand guano	200	June 3	3	4	Poor.
Kangaroo brand guano	400	" 3	2	51	Poor.
Nitrate of soda	200	May 29	1	48	Poor.
Muriate of potash	200				

Big Purple Straw wheat was used in each case, 45lbs. per acre being sown. The land was farmers' fallow, loose loamy soil with limestone rubble subsoil above clay.

STOCK COMPLAINT.—Mr. Anderson reported complaint amongst sheep causing death. They get lame, would neither eat nor drink, and in two or three days die. On opening the bodies he found the internal organs apparently healthy, but the gall was very full, in some cases nearly to bursting. Members thought dry innutritious food the cause of the trouble, resulting in acute indigestion or impaction. Cattle are reported to be dying of this latter trouble. The Hon. Secretary said a neighbor had a cow so stiff in the legs that she could not travel a quarter of a mile to water. The owner gave her three or four raw eggs daily for about a fortnight and she was now all right.

Dawson, February 17.

Present—Messrs. R. Renton (Chairman), P. J. Byrne, J. Collins, C. W. Dowden, A. J. Hooper, C. F. W. Just, W. Kelly, C. H. Meyers, O. Muller, A. H. Warner, A. F. Dempsey (Hon. Sec.), and three visitors.

RABBIT POISONING.—The Chairman stated that after reading the favorable report by the Government Vermin Inspector on use of cyanide of potassium for poisoning rabbits, he gave it a good trial. He followed the instructions, using about 1oz. of poison to 8galls. of water, but though the weather was hot both day and night, no other water available, and rabbits poor and plentiful, he did not find a single dead one; in fact, they did not appear to have touched the water. He then soaked wheat in the solution and placed it around the burrows; the wheat has disappeared, but no dead rabbits were to be found. He was now using phosphorus with good effect. Mr. Renton distributed 1lb. of cyanide amongst the members for trial. [The very greatest care must be exercised with this poison, otherwise serious results will follow.—GEN. SEC.]

HAILSTORM RELIEF FUND.—Matters in connection with fund raised locally for relief of those whose crops were destroyed by the hailstorms last season were dealt with. It was shown that ninety-six bags of wheat and nearly £14 in cash had been collected, and there were still several collecting books to come in. It was decided that seed wheat only be distributed, and the cash in hand will be spent in purchasing same. Two members offered to supply good clean seed at 10s. per bag.

Appila-Yarrowie, February 9.

Present—Messrs. J. Wilsden (Chairman), J. C. W. Keller, A. Fox, J. M. Grant, N. Hannagan, J. H. Bottrall, W. Stacey, J. O'Connell, W. C. Francis, J. H. Klemm, C. G. F. Bauer (Hon. Sec.), and one visitor.

MANURES.—Members who used super. last year with their wheat crops speak very highly of its effect. Different quantities per acre have been used, but about 60lbs. is considered enough in this district for grain crops, and 100lbs. for hay crops. The quantities mentioned will give the crop a start and cause it to grow during the winter when the weather is cold.

EAR-MARKING SHEEP.—Mr. Fox read an extract on this subject. He said the ear-marking had been greatly abused, but if the lambs' ears were tattooed the marks would last as long as the animal, and were easily made.

SEED EXPERIMENTS.—Members reported that owing to the dry season and the ravages of the grasshoppers their experiments with various seeds were not a success.

STOCK COMPLAINTS.—Members stated that the disease amongst cattle was prevalent again this season, symptoms being the same as previously reported. Stockholm tar on the nose of the animal was stated to act as a preventive, the tar being licked off gradually.

Narridy, February 3.

Present—Messrs. A. McDonald (Chairman), W. J. Martin, J. Liddle, H. Nicholls, E. Smart, A. Bairstow, and J. Darley (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—A discussion took place on this subject, the members favoring fixed standards for wheat. It was decided to bring the matter forward at the Gladstone Conference. Mr. Martin tendered his resignation as he was leaving the district, and regret was expressed at the loss of his services. In replying to a complimentary vote, Mr. Martin referred to the great value of the work of the Bureau, and regretted more interest was not taken by the farming community in their meetings.

Mount Compass, February 10.

Present—Messrs. M. Jacobs (Chairman), W. Gowling, R. Cameron, A. Sweetman, R. Peters, F. Slater, C. S. Hancock, A J. Hancock (Hon. Sec.) and one visitor.

VISIT TO HOMESTEAD.—Members met at residence of Mr. R. Peters, and before ordinary business was taken, inspected the blocks at the lower end of the swamp. The crops of onions and potatoes generally were looking very good. Mr F. McKinlay wished to know how to treat plum trees that sent out long straight growths which bend over and spoil the shape of the tree.

FEDERATION AND THE PRODUCERS.—Mr. Peters read a paper on "How will Federation Affect the Producers in this District," to the following effect:—

He had no doubt this question had suggested itself to the minds of most of their members, and though the subject was naturally somewhat obscured, there would be no harm in considering the probable effects of federation. The accomplishment of federation means the abolition of border duties, which have to a certain extent protected us in the past from too acute competition by growers in the other colonies; consequently the locality best suited to the production on any particular product will be best fitted to compete in that line of production. The removal of duties will tend to equalise prices, which will be governed by the supply and demand. Climatic and soil conditions, facilities for transport, distance from market, would all affect the position. He hoped they would not admit that the residents of Mount Compass were anyways less capable than those of other parts of the Commonwealth. Their soils were suitable to the cultivation of the potato, and bearing in mind that owing to the handling, &c., that imported potatoes were subjected to, they could not command the same price as good local tubers, they should have nothing to fear in this line, at least from competition with the neighboring colonies. They must, however, study how to make the best possible use of the natural advantages of the district, as well as the best means of getting their produce to market. The swamp lands must be laid out and drained, so that horsepower instead of hand labor can be utilised. Put their produce in the hands of the consumer with as little expense for handling as possible. Co-operation was gaining ground in the district, and in the near future will play a more prominent part in this direction. To make the holding a greater success they must produce as great a variety as possible of profitable crops, so that there is at every period of the year something that can be turned into money. Wattles will do well on land not suitable for other crops, and he had no doubt would be the means of a considerable revenue later on. Much of the second quality land was suitable for growing summer crops for cows, pigs, &c., all of which will be of assistance in meeting any temporary disadvantages brought about by the accomplishment of federation. Then there was no doubt that with the continued growth of production in the South they would have a railway to Willunga, which would reduce the expense of carriage of their produce. Federation would also directly benefit the producers in many ways. There was one thing they lacked, and that was permanent industries employing large numbers of men. The development of the mining industry would lead to largely increased consumption of their products, and even in their own immediate neighborhood there were indications that at no distant date they might expect to have a community of consumers engaged in mining and kindred industries.

Nantawarra, February 12.

Present—Messrs. E. J. Herbert (Chairman), J. Nicholls, S. Sleep, R. Uppill, C. Belling, J. W. Dall, E. J. Pridham, T. Dixon (Hon. Sec.), and eight visitors.

STANDARD SAMPLE OF WHEAT.—The Hon. Secretary reported having forwarded sample of wheat to Chamber of Commerce in response to request for samples on which to fix the standard sample for the season. A discussion ensued as to the advisableness of forwarding samples in the future to the Chamber of Commerce, but members thought it would be better to continue to do so when requested, though they were of opinion that the farmers should be represented when the standard was fixed.

MANURES.—A long discussion ensued on results of last season's use of fertilisers. Mr. Belling considered some of the manure had not been used to best advantage, being applied to land not fallowed, the consequence being that the returns were very poor. At their own farm the early fallow yielded 14bush. per acre, and the return decreased as the land was worked up later. Some green land just ploughed up, manured with the same manure, only yielded 1½bush. As an experiment he put in a few acres each with equal value bone super., English super., super. guano, and complete manure, but as there was no perceptible difference in the appearance, he did not reap them separately. He thought that dry working was conducive to black rust, which was so prevalent last year. Mr. Houston drilled in about fifteen acres of Early Para which promised very well, but black rust affected it so badly that the total return was only twenty-five bags. Fillbag wheat alongside yielded 14bush. per acre, and he could not understand why one variety should be so badly affected, as they were both worked and treated exactly the same. [Most probably the Early Para seed was infected with spores of the black rust fungus, whilst the Fillbag seed was free from infection.—GEN. SEC.] Members thought that the land cropped during the past year not fallowed which gave such poor returns should give a fair crop this year, some of it being almost like bare fallow. They were also of opinion that the poor returns from fresh ploughed land compared with fallow were due to the fact that the moisture was stored up and conserved in the fallow land, and thus enabled the wheat plant to withstand the dry spells so much better than it did on the ploughed land. Mr. J. Nicholls said his experience was the same as Mr. Belling's; early fallow was best, going up to 14bush., while land not fallowed, and put in late, only went 3bush. He had two drills working side by side, and with same quantity and kind of seed and manure, but one was working about 1in. deeper than the other; the shallower sown portion looked much better than the other, but he did not reap them separately. Mr. Herbert's experience was just the opposite. He got his best returns from wheat sown deep on land fallowed in the previous June and drilled in dry, 4¾bush. of seed to five acres; seed was not pickled. There was less bunt in this crop than in crop sown with pickled seed, which he could not account for. The Hon. Secretary's results were similar to Mr. Belling's. Early fallow gave far the best results, while land not fallowed yielded very poorly. The same value of English super. and super. guano put in side by side showed no difference in the crop; when finishing he put on 2cwts. per acre super., but it gave no better return than where 120lbs. per acre alongside was drilled in; the land was not fallowed. He believed that had the season been wetter there would have been considerable difference in results. Mr. Spencer said one farmer got as good results from drilling in 30lbs. super. and 30lbs. wood ashes as his neighbor on adjoining land got from 75lbs. super. After discussion it was resolved that 80lbs. per acre was about the most profitable quantity of fertiliser to use in this district.

Minlaton, February 17.

Present—Messrs. Jas. McKenzie (Chairman), W. Correll, Jno. Anderson, Jos. Bennett, J. Martin, D. G. Teichelmann, M. Twartz, H. Boundy, and J. Correll (Hon. Sec.).

MACHINE BELTS.—Mr. W. Correll said he found the best material to apply to machine belts to prevent them from slipping was honey. A piece of leather round the pulley was better than anything on the belt; a little oil occasionally was then all that was necessary to prevent the belt from slipping.

STRIPPERS —Members generally had found that they had a deal more cracked grain this season in the stripped wheat than was usual. Mr. W. Correll thought it would be a decided improvement if the machines could be made with two easily adjustable speeds, so that on hot days a slow speed could be readily obtained. The Hon. Secretary had found that if strippers had extra large fly wheels they would run very much heavier than they should; if these were cut down a good deal the draught would be much easier and the speed greater, as with a small fly wheel the crown does not slip so readily.

MANURES.—Members generally agreed that the many advantages claimed for the so-called "complete manures" by the vendors' agents were not in evidence in the results in this district at least, as in most cases they got equally good returns from the purely phosphatic manures as from the complete fertilisers.

Arden Vale, February 12.

Present—Messrs. A. Hannemann (Chairman), M. Eckert, C. Pearce, J. Francis, D. Liebich, L. Warren, G. Miller, and E. H. Warren (Hon. Sec.).

IMPROVEMENTS TO WINNOWING MACHINES.—The Chairman read a paper on this subject to the following effect.

In preparing our wheat for the markets of the world the winnower has an important work to perform, and although we all admit the good qualities of our latest improved machines, there is still room for further improvement. He made a few suggestions. It would be of great advantage if an arrangement could be made which would render it unnecessary to shift the machine every time the wind changes. If, instead of being open at the back, the winnower would have a closed receptacle for receiving the chaff, from which it could be worked away, say, half a chain, with a canvas belt fitted with spikes. The fixture holding the end of the belt could be made so that the belt could be raised or lowered, according to the height of the chaff heap. Another advantage would result if an apparatus for thrashing the headings and whiteheads were fixed in the machine. This would save all the trouble of thrashing the headings afterwards. Whiteheads very often spoil the sample of the wheat, and a very simple arrangement in the winnower might overcome the difficulty. It might be necessary to obtain horsepower to work the machines, and if we had not to shift them so often—if the chaff were worked away as suggested—horseworks similar to those used for chaffcutting, but lighter, might well be adopted.

RABBIT POISON.—Members reported the following poison preparation to be valuable for destroying rabbits:—Boil 1lb. arsenic, 1lb. washing soda, and 2lbs. sugar, in 2galls. water for ten minutes; then stir in pollard and wheat until a proper consistency is secured.

RAINFALL FOR 1899.—Recorded by the Chairman, 12·6in.; by Mr. Eckert, 13·63in.

Baroota Whim, February 15.

Present—Messrs. F. H. Flugge (Chairman), T. Simper, A. Raneberg, F. C. Bessen, and C. W. Hoskin (Hon. Sec.).

SEED EXPERIMENT.—Mr. Flugge reported that King Humbert tomato, grown from Bureau seed, had done well. The fruit were large, yellow, and prolific.

Angaston, January 20.

Present—Messrs. J. E. Swann (Chairman), A. Friend, F. Saltar, R Player, P. Radford, S. O. Smith, E. S. Matthews (Hon. Sec.), and one visitor.

Bureau Journal.—The Hon. Secretary read a lot of extracts culled from the latest issue of the *Journal of Agriculture* (of South Australia), and members were so pleased with the same that they proposed to follow the example each month.

Angaston, February 17.

Present—Messrs. J. E. Swann (Chairman), A. Sibley, A. Salter, R. Player, S. O. Smith, A. Friend, J. Vaughan, E. Thamm, F. Salter, and E. S. Matthews (Hon. Sec.).

Annual Report.—Eleven meetings were held during the past year, with average of nine members in attendance. Papers read—"Apple Export Trade," "Agricultural Shows," "Visit to Mount Gambier," "Zante Currants," "Farming Failures," and "Monthly Gardening Notes." The rule *re* non-attendance has been strictly adhered to. Congress furnished items for report by delegates thereto, and for discussion thereon. Sub-committees had been appointed on Codlin Moth and Phylloxera, and action taken thereon. The monthly Saturday night meeting has proved more convenient than that on Wednesday night. The *Journal of Agriculture* has been regularly received by members, and is greatly appreciated. Seeds for experimental purposes have frequently been received from Central Bureau, and notes have in most cases been taken of results. A social meeting was held at the Chairman's residence at the commencement of the year, and was a great success.

Officers.—Mr. F. Salter was elected Chairman, and Mr. E. S. Matthews re-elected Hon. Secretary. The officers for the past year were thanked.

Agricultural Shows.—The members will consider the following proposition at next monthly meeting:—"That the Government be approached by the Central Bureau with a view to having the Government subsidies withdrawn from many of our minor agricultural shows, as we believe this will lead to an amalgamation of many to the advantage of the few, but larger societies remaining."

Amyton, February 8.

Present—Messrs. Joseph Gum (Chairman), James Gray, Wm. Mills, H. Turner, H. Gray, Wm. Hawke, Wm. Hughes, S. Thomas (Hon. Sec.), and one visitor.

Attendance.—It was resolved to strictly enforce the rule *re* absence of any member for three consecutive meetings without reasonable excuse.

Business.—Only formal business was transacted, in consequence of the member who had promised to read a paper being absent. [When there is a fair attendance, as there was in this case, the *Journal of Agriculture* would have afforded several topics worthy of some consideration.—Gen. Sec.]

Pyap, February 21.

Present—Messrs. B. T. H. Cox (Chairman), J. Bowes, J. Holt, W. Axon, H. E. Mills, T. Smith, J. H. Bankhead, J. Arnold, and W. C. Rogers (Hon. Sec.).

Officers.—Mr. J. Bowes was elected Chairman.

Rabbits.—Rabbits are dying in great numbers in the back country from starvation. They have barked most of the trees and shrubs. The usual form of rabbit-proof wire netting is not effective, as the rabbits burrow beneath it. Poisoning with phosphorus baits is most favored by farmers on account of the ease with which the poison is prepared. Poisoning with strychnine, sugar, and pollard is effective, and pays well when the skins are taken off.

Best Wheats for the District.—The favorite wheats in this locality are Purple Straw, Steinwedel, and Rattling Jack. The latter is an early wheat, and, with Steinwedel, lengthens the time of harvesting, so that the farmer can get in his crops more leisurely than where all the crop is ripe at once.

Renmark, February 15.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, R. Kelly, M. Chapman, S. R. Cox, E. E. Hutton, H. Swiney, and E. Taylor (Hon. Sec.).

Experimental Orchard.—The Under Treasurer wrote that the Treasurer had received a favorable report *re* establishment of an experimental orchard at Renmark, and inquired whether the members of the Branch would undertake its management, &c., and also furnish an estimate of what the cost would be. Decided to publish the letter and call a meeting of all orchardists of Renmark and River Murray to discuss the matter.

Morgan, February 10.

Present—Messrs. R. Windebank (in chair), E. Jacobs, A. Stubing, J. Bruhn, H. Hahn, G. Roediger, and J. Wishart (Hon. Sec.).

Officers—Resignation of the Chairman, Mr. J. Jackman, was accepted with regret. Mr. R. Windebank was elected Chairman and Mr. J. Wishart re-elected Hon. Secretary for ensuing year. Members present pledged themselves to a more regular attendance in the future.

Experiments.—Mr. Jacobs tabled fruits of tomato (Semperfructifera) of excellent quality. Mr. Stubing reported having obtained 20lbs. good grain from 22ozs. of Bartlett's Crossbread wheat sown last season. This variety was nine days earlier than Steinwedel sown at the same time.

Golden Grove, February 15.

Present—Messrs. T. G. McPharlin (Chairman), S. A. Milne, J. R. Smart, F. Buder, R. Smith, H. Bowey, J. Woodhead, J. Anderson, H. P. Day, Jno. Rose, and A. Harper (Hon. Sec.).

Binder and Header—The Chairman initiated a discussion on "Does it pay to use the header?" His experience had been against it, the loss being 12s. 6d. per acre taking wheat at 2s. 6d. per bushel, and hay at £2 per ton. He believed, however, that with up-to-date machinery, and doing the work on a larger scale, the financial results would be very different. Mr. Woodhead thought heading would be the most profitable method so long as there was so little difference between the price of headed hay and ordinary hay. Mr. Smith recommended the use of the header for seed requirements, as the grain was not damaged to any extent, and in a small way a selection for seed wheat would be made, as most of the undeveloped and inferior grain was left near the band of the sheaf. It was not thought desirable on the whole to go in for extensive operations with the header, as to secure a good sample of grain the crop must be left until too ripe to make the best hay, while for wheat alone the stripper was the most economical machine.

Licensing of Stallions.—A vote was taken on the question of veterinary examination and licensing of stallions, six being opposed, two in favor of the proposal.

Elbow Hill, February 13.

Present—Messrs. E. Wake (Chairman), H. Dunn, W. Spence, J. Elleway, J. Rehn, J. Harvey, G. Wheeler (Hon. Sec.), and six visitors.

Rabbit Destruction.—Mr. Elleway thought the best way to poison rabbits was to use a length or two of roof guttering in different places, to be filled with poisoned water. Members wanted to know what quantity of strychnine was required for 5galls. of water. [Can any member furnish the information?—Gen. Sec.]

Wheat Experiments.—Members reported favorably of Petatz Surprise wheat, and agreed that it was well suited to the district. Other experiments with seeds have been practically failures owing to the very dry season experienced.

Johnsburg, February 10.

Present—Messrs. F. W. Hombsch (Chairman), T. Thomas, T. A. Thomas, H. Arnold, F. W. Smith, P. Caughlan, G. H. Dunn, J. Sparks, M. L. Read, W. McRitchie, and T. Johnson (Hon. Sec.).

Seed Drill.—Considerable discussion took place on the question of purchasing a seed drill for use in the district. Mr. Potter thought the Branch might purchase a drill and hire it out to members and others who desired to try the experiment of drilling in a portion of their crops. Owing to the severe frosts experienced last season a large portion of the wheat crops were damaged, and one or two members thought if they used manure it would force the wheat on to maturity earlier. Several members doubted whether it would pay to apply fertilisers in a district where the seasons were so variable. It was decided to let the question of purchasing a drill stand over for the present.

Rabbit Destruction.—The Hon. Secretary said that a plan had been brought under his notice by which rabbits' warrens could be effectually destroyed by means of dynamite. A plug of dynamite was attached to the rabbit after inserting the fuse and detonator. The rabbit would, of course, carry the charge into the warren, where the explosion and the fumes would kill all in the holes, besides destroying the warren. A shovelful of earth should be handy to close up the hole as soon as the rabbit diappears, in order to prevent the fumes escaping. Great care and celerity is necessary in carrying out this work.

Lipson, February 10.

Present—Messrs. S. F. Potter (Chairman), G. Provis, Geo. Carr, W. F. Darling, Jas. Brown, E. Thorpe, Chas. Provis, J. Wishart, R. Haldane, E. J. Barraud (Hon. Sec.), and several visitors.

Manuring.—Members and visitors reported results of past season in the use of fertilisers. Mr. Geo. Provis used 75lbs. English super. and got 10bush. per acre against 5bush. from land alongside not manured. Mr. Darling's manured crop gave more than double the rest of his crop. Mr. Brown had similar results from English super., whilst Mr. Wishart cut twice as much hay where English super. was used as where local guano was applied. Mr. C. Provis broadcasted the super. at seeding; result, 8bush. against 3bush. from unmanured land. Messrs. France Bros. got 11bush. per acre, using 50lbs. English super.; unmanured yielded only 4bush. Mr. Sullivan's returns were 17bush., from English super., 70lbs. per acre; 7bush. from unmanured land. Both lots were in the same paddock. Messrs. Barraud Bros. drilled in 60lbs. to 70lbs. English super. on land ploughed dry in March, and got twice as much wheat as from unmanured land worked in the same way. Manured fallow land yielded nearly three times as much as unmanured fallow. The quantity of super. used has varied from 50lbs. to 75lbs. per acre, members being of opinion that 50lbs. to the acre, put in with the drill, was a fair dressing for this district.

Boothby, February 18.

Present—Messrs. J. T. Whyte (Chairman), H. G. Evans, R. Carn, J. Bell, R. Chaplin, E. Bradley, J. R. Way, G. T. Way, T. Robinson, T. Sims, and R. M. B. Whyte (Hon. Sec.).

SEED EXPERIMENTS.—Mr. Evans tabled samples of Indian King and Bartlett's Crossbred wheats, grown from Bureau seed; the former was rather flinty. Mr. Bell tabled sample of Petatz Surprise wheat. From one bag of seed purchased by the Branch he reaped 18bush. of good grain. Dart's Imperial had done well again this year. The Chairman asked the members to bring samples of the various wheats grown by them to the next meeting for purpose of comparison.

BAGS.—The bag question was again discussed. Members considered it unfair that the farmer should be docked for patched bags if they are good enough to carry the wheat properly.

BLUESTONE.—Mr. Carn thought it would be well for the members to obtain the bluestone required direct from Wallaroo. He understood it deteriorated from exposure if kept too long. Members thought they would not gain much by carrying out the suggestion. [By exposure the bluestone oxidises and takes up a small quantity of water, which reduces the crystals to powder, but the strength of the bluestone is not decreased to any extent that can be measured. —GEN. SEC.]

OATS.—Mr. Way asked whether it would pay to sow oats on poor land for feed. Mr. Sims considered they would blow away on poor light soil, but would do well in good land.

HON. SECRETARY.—Mr. R. M. B. Whyte tendered his resignation as Hon. Secretary and was thanked for his services. Mr. A. Robb was appointed to the vacant position.

Pine Forest, February 6.

Present—Messrs. R. Barr, jun. (Chairman), J. St. J. Mudge, J. Phillis, W. H. Jettner, A. Inkster, G. Inkster, A. Mudge (Hon. Sec.), and one visitor.

BAGS.—Mr. J. St. J. Mudge initiated a discussion on the bag question, and after considerable discussion it was resolved that the Branch protest against the present system of selling bags as wheat.

COMMERCIAL FERTILISERS.—The Chairman called attention to the publication in the daily papers of the analysis of samples of fertilisers obtained by the Inspector of Fertilisers.

Port Broughton, February 12.

Present—Messrs. R. W. Bawden (Chairman), E. Dalby, A. H. Dolling, E. Dennis, J. Harford, S. M. Bawden, and J. Barclay (Hon. Sec.).

BRANCH SHOW.—It was resolved that the Branch is not in favor of holding the usual combined Branch show at Port Broughton, but propose to call a public meeting to consider advisableness of holding a public show in the district. The motion of censure passed at Pine Forest Branch for allowing the proposed show in 1899 to fall through was also discussed.

SALTBUSH.—Mr. Dalby wished to know how to establish saltbush permanently on the land. He had tried sowing seed and setting out the young plants on salty and other soils. [Saltbush can either be sown direct where it is to be grown, sown in nursery beds and transplanted, or, in some cases, grown from cuttings. Sometimes the seed may take a long time to germinate, but there is usually little difficulty in getting the plants to grow when set out if suitable time is selected, *i.e.*, when the ground is warm and somewhat moist. This should be either after the first autumn rains or in spring. Cuttings can be set out at same times. Stock must be kept off the land until the plants are firmly established.—GEN. SEC.]

Hahndorf, February 24.

Present—Messrs. A. von Doussa (Chairman), F. H. Sonnemann, C. Bom, H. Spoehr, J. C. Rundle, P. Schubert, and D. J. Byard (Hon. Sec.).

CODLIN MOTH.—Mr. Schubert described the steps he had taken to deal with the codlin moth in his garden, and the success which had attended his efforts. He had also endeavored to interest the children under his charge at the public school by showing them the insect in its various stages, and by keeping it under observation from the egg to its maturity, explaining how and why certain preventive and remedial action was effectual in reducing the pest. He was confident that the children were now proving helpful to their parents in fighting this insect. Members were of opinion that a decided improvement had taken place in the condition of the orchards round Hahndorf, as the owners were in almost every instance carefully carrying out instructions given as to bandaging, destroying infested fruit, &c. Mr. Spoehr said from his experience he was confident that while the codlin moth caterpillar would sometimes bore its way into potatoes and tomatoes, it would not live in them. Mr. Sonnemann referred to services rendered by small birds and fowls in destroying the caterpillars.

Mundoora, February 16.

Present—Messrs. R. Harris (Chairman), W. Aitchison, W. D. Tonkin, W. J. Shearer, W. Mitchell, J. J. Vanstone, D. Owens, J. Blake, A. E. Gardiner (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—The Hon. Secretary tabled standard samples of wheat for seasons 1895-6 and 1899-1900, as received by the Branch from the Chamber of Commerce. Both were fixed at 63lbs. to the bushel, and the latter was considered to be far superior in quality to the 1895-6 sample. The Hon. Secretary considered the farmers of South Australia did not in the slightest degree deserve the reflection cast upon them by Professor Lowrie's remarks concerning the present season's standard sample. Most of the other members also spoke, and strongly condemned the professor's statement that the sample was a disgrace to the farmers and that something was wrong in the way the samples were collected. Members considered the statement unwarranted, and that no good would result from the slur cast on the farmers and the agents who had sent in the samples. Considering the very adverse season it was thought the sample weighing 63lbs. was distinctly creditable. In regard to the presence of bunt in the sample only half of a small bunt ball could be noticed in the sample sent to this Branch. The Hon. Secretary explained that the sample forwarded by this Branch was collected by Mr. Watt and himself from the sample bags taken from the stacks in the local railway yard aggregating 20,000 bags. By means of a tester the sample was taken from different parts of these bags, and he failed to see what could be fairer. It was very poor thanks, after giving both time and trouble to this work, to be told that there was something wrong in the way the samples were obtained. The rainfall from April 1 to November 1 totalled 7·52in., while July only recorded 0·23in., and August 0·39in., with severe frosts, so that it was unreasonable to expect a heavier sample. Some of his neighbors got wheat weighing 65lbs. to the bushel. [In regard to presence of bunt in the standard sample, the bag of wheat upon which the professor's remarks were based contained a considerable number of bunt balls, besides oats, chaff, some green grains, &c., and the whole smelt decidedly strong of bunt. This led to his statement that there must have been something wrong with *some* of the samples sent in, but the professor never intended to infer that *all* the samples were bad. If most of the samples were free from bunt and reasonably clean there must have been one or more badly infested, and of such a character that no agent would have paid full market price for same; consequently they should have been excluded when the standard sample was fixed.—Gen. Sec.]

Bluestone.—The Chairman was convinced that inferior bluestone was sold in many districts, and hoped that the Central Bureau would be able to ascertain to what extent this was the case. Members promised to send samples for testing.

Manures.—Mr. G. Haines wished to know whether if well-sifted stable manure and superphosphate were mixed together the former would have any injurious effect upon the latter.

Inkerman, February 13.

Present—Messrs. D. Fraser (Chairman), C. H. Daniel, W. Board, T. Forrest, J. Lomman, E. M. Hewett, G. Peters, W. Fraser, and W. A. Hewett (Hon. Sec.).

Poison Weed.—Mr. Daniel tabled specimen of weed supposed to be poisonous and to have caused death of stock at certain seasons for several years past. Mr. Forrest lost 200 sheep in April, 1898, and believed they were poisoned by a plant similar to this. Mr. Peters thought the plant was only injurious while the berries were red. Mr. Lomman described plant (considered by members to be "native tobacco") which he fed to his pigs, causing the death of two. Another one was saved by treating for poisoning.

Grub Pest.—A member reported that this pest was spreading to an alarming extent, hundreds of acres having been cleared of every vestige of grass. They were particularly bad on uncultivated lands. Mr. Forrest stated that some insect was destroying tamarisk trees by boring right through the branches.

Port Pirie, February 17.

Present—Messrs. P. J. Spain (Chairman), W. Wood, G. M. Wright, T. Gambrell, J. Lawrie, F. R. Humphris, E. J. Hector, G. Hannam, T. A. Wilson, W. Smith, and R. J. Ferry (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Mr. Spain tabled standard sample of South Australian wheat for 1899-1900, which was considered very good by the members. Mr. Lawrie reported on discussion of this subject at Gladstone Conference, at which resolutions advocating fixed grades for South Australian wheat were carried.

GLADSTONE CONFERENCE.—Mr. Lawrie reported on proceedings of Conference at Gladstone, and Mr. Hector on the matter of trucking lambs and other live stock to Adelaide.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the past year twelve meetings were held with an average attendance of ten members. Two papers had been read and discussed, in addition to a number of important subjects. A number of experiments with seeds had been carried out, and specimens of various kinds tabled. The Branch had been represented at the Annual Congress in Adelaide, and at the Branch Conferences at Port Broughton and Gladstone. A pure-bred Ayrshire bull had been obtained on loan from the Department with a view to the improvement of the dairy herds of the district. The local fruit shops had been inspected, but only in a few instances could traces of the codlin moth caterpillars be found. Generally increased interest had been shown in the operations of the Branch, which was working for the advancement of the agricultural and pastoral pursuits of the district. A vote of thanks was accorded to the Hon. Secretary for his report; also to the retiring officers who were re-elected for ensuing year.

Mount Bryan East, February 17.

Present—Messrs. T. Wilks (Chairman), W. Bryce, J. Prior, E, Prior, H. Wilkins, R. Webber, W. Quinn, J. Honan, and W. Dare (Hon. Sec.).

EXPERIMENTS.—Mr. Wilkins sowed about half a cupful of King's Early wheat in his garden, and reaped about ½gall. of good grain. From the same quantity of seed of Bartlett's Crossbred wheat he got 1½pts. of grain. The straw of this variety was very thin. Mr. J. Prior reaped about ½gall. grain from half a cupful of King's Early wheat sown on a ploughed paddock after his general crop was all in. The King's Early ripened at least two weeks before the rest of the crop. Mr. Wilkins used bonedust with tomatoes, but the grasshoppers eat the plants off.

Port Elliot, February 24.

Present—Messrs. J. McLeod (Chairman), H. Green, sen., J. Davidson, J. Brown, W. E. Hargreaves, H. Pannell, F. T. Fischer, and E. Hill (Hon. Sec.).

BEST WHEATS.—In reply to question, Mr. Brown said he regarded King's Early and Leak's Rust-proof as the two best wheats for this district.

POTATOES.—Discussion took place on best means of protecting potatoes from the caterpillars of a small moth which gets into the bags however closely they are tied. Mr. Fischer kept his potatoes free by putting them on a bed of seaweed, and covering the surface with seaweed and soil. Attention was directed to the necessity for care in the selection of seed. For wet ground whole seed was approved, though the largest tubers were obtained from cut setts. A variety known as North Pole is coming into favor in this district.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— March 1, 1900.

The character of the summer has been maintained, the spells of hot weather, or, as they are now coming to be termed, "heat waves," though severe while they lasted, being of only short duration, so that the mean temperature of the season is likely to prove below average. The month just closed has been dry, even for February, so that throughout many country districts our settlers have again had to resort to water-carting for stock and domestic purposes. Dry feed is generally plentiful, but if we are to have a full winter supply rain should occur during this month to bring along vegetation ere the cold weather sets in.

Trade is steady, but somewhat quiet, even for time of year, the disinclination on the part of many of our wheatgrowers to sell their grain at present rates restricting business, especially in country districts. Steady work is being done in most of the new mining centres, and if the market for metal keeps up satisfactory results are likely to be realised.

In breadstuffs another uneventful month has been experienced, a slight firming in European rates, which led to several cargoes of wheat from this colony being disposed of at 29s. 6d. per 480, c.i.f., London, not being sustained, late offers indicating at least 1s. per quarter drop, with buyers apparently not anxious to operate. The prospects of any substantial advance in price do not seem very bright at moment, though most holders still remain hopeful of a forward movement. Locally the price is about ½d. higher than that we last quoted, but owing to heavy freight engagements that had been entered into with Europe, strengthened by large orders for steamer shipments to South Africa, Melbourne shippers had an exciting time during the month, having to pay for most 2d. a bushel over our rates—of course to the benefit of Victorian farmers. Sydney has ruled about equal to Adelaide, but trade in breadstuffs there is said not to be in a very healthy condition, both flour and offal lines selling cheaper than with us. Our millers find only an ordinary trade doing locally in flour; the price is about 2s. 6d. per ton higher, in sympathy with the improvement in wheat, but neither millers nor bakers seem much disposed to enter into fresh contracts. An unusually strong demand for bran and pollard exists in the country districts, even city mills being drawn upon for supplies in some directions from which we usually obtain large quantities of millers' offal, and this occurring whilst the mills are running full time, as at present, would point to heavy consumption of bran and pollard by dairymen, who are encouraged to feed by the good price ruling for butter. Forage lines show slight improvements in quotations, but this does not arise from any increase in demand rather from our farmers, seeing heavy exportations of fodder from Melbourne and Sydney, being induced to hold more firmly, in the hope of higher rates ruling later.

The spirit of the potato market has been somewhat dull, a slight easing in price showing, but as the local crops are becoming exhausted, growers of the favorite tuber in the South-East will obtain increasing control over the market, which should lead to some improvement on present low rates, assisted as such would be by the recent advance in values intercolonially. Onions have been sluggish, but as most of those now being dug are from cooler districts, and therefore better keeping sorts, values are inclined to harden, though some soft samples still about are being offered at ridiculously low rates.

Another satisfactory month for producers in most dairy lines can be reported, the shrinkage in supply of milk being compensated for by at least a corresponding improvement in the value of butter, though it is regretable that a shortage in supply exists which has to be filled by importations of cream and butter. As the season for the shipment of the latter to Europe is about closed, and there will for several weeks at least be a surplus available in New South Wales and Victoria, we must expect values here to ease back a little to prevent this market being glutted from the eastern colonies. This need not, however, cause any apprehension of serious collapse in price, but rather a temporary steadying down in value. In eggs, trade during the month was very pleasing, West Australian buyers showing very decided preference for those shipped from this port. Values advanced 2d. per dozen, though a drop of 1d. occurred at last sale, but this is likely to be recovered during the week, as buying orders are increasing, and the seasonable advance as we approach Lent may be reckoned upon. The trade in bacon during the month shows price unaltered, although there has still been a scarcity of handy-sized stuff, with a plethora of heavy and coarse. Large quantities of cheese have been placed, increased consumption being induced by the relatively low selling rates, so that stocks are somewhat light. The high price of butter has caused most of the factories to cease from cheese-making; still the future of the market does not look too hopeful, as but very little of the stock held is of first quality. Only moderate business doing in honey. This line is now getting centred in fewer hands, so that an improvement to more reasonable values may be soon expected. New almonds are coming in freely, but except for immediate requirements buyers are holding off as samples are somewhat green. Quite a satisfactory recovery in trade in poultry has been established, considerably increased quantities being marketed and realising improved prices.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 8d. to 2s. 8½d.; outports, 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 7s. 6d. to £6 10s.; country, £5 15s. to £6 per ton of 2,000lbs.

Bran, 9d.; pollard, 10d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 2d.; good stout white, 2s. 7d. to 2s. 10d. per bushel of 40lbs.

Barley.—Malting, 3s. to 3s. 6d.; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 12s. 6d. to £3 17s. 6d. per ton of 2,240lbs., dumped, bags in, f.o.b. Port Adelaide.

Potatoes.—Local, new, £2 15s. to £3; Mount Gambiers, £2 16s. to £2 18s. per 2,240lbs.

Onions.—£2 to £2 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 2d. to 1s. 5d.; dairy and collectors', 9d. to 11½d. per pound; bulk, 11d. to 1s. 1d.

Cheese.—S.A. factory, best, 6d. to 6½d.; ordinary to fair 4d. to 5d. per pound.

Bacon.—Factory-cured sides, 6d. to 6½d.; nice farm lots, 5d. to 5½d. per pound.

Hams.—S.A. factory, 7d. to 8½d. per pound.

Eggs.—Loose, 9½d.; in casks, f.o.b., 11½d. per dozen.

Lard.—In bladders, 5½d.; tins, 4½d. per pound.

Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.

Almonds.—Soft shells, 3½d. to 4d.; kernels, 10d. per pound.

Gum.—Best clear wattle, 1½d. per pound.

Poultry.—Nice table roosters, 1s. 6d. to 1s. 10d. each; medium cockerels to good hens, 1s. to 1s. 5d.; half-grown and light birds, 8d. to 11d.; good ducks, 2s. to 2s. 4d.; fair birds, 1s. to 1s. 10d.; geese, 3s. to 4s. 9d. for heavy weights; pigeons, 5½d.; turkeys, 6½d. for medium birds, up to 8d. per pound for prime table sorts.

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NOTES AND COMMENTS.

The weather during the past month has been favorable on the whole, as far as the Southern districts are concerned. Nice soaking showers, with intervals of cool weather, have caused the grass to grow, and indications point to a good early grass season. In the Northern districts the rainfall has been light and patchy, and seeding operations have been pushed on with a dry seed bed. The month closes with splendid rains, however, in the North and on the West Coast, which should be very beneficial to the crops already sown. Water is very scarce in many parts, and a good general fall of rain would be welcomed. Our weather and crop reports have beeen conspicuous for their absence from the past three or four issues owing to absence of news to chronicle, but will appear regularly in the future.

The standard sample of wheat for season 1899-1900 has been fixed at 62½lbs. in Victoria and 61½lbs. in New South Wales, as compared with 63lbs. per imperial bushel for South Australian wheat, and this fact has been used as an argument to prove that it would be detrimental to the farmers had our standard been fixed higher. This, however, does not explain away the fact that in some of the sealed samples sent out by the Chamber of Commerce bunt balls and weed seeds were conspicuous, and consequently the wheat would weigh less than if decently clean. Professor Lowrie's remarks at the meeting of the Central Bureau are worthy of careful attention. In dealing with this question it must not be thought that there is any antagonism between the Bureau and the Chamber of Commerce, as such is not the case.

A deal of wheat from Argentina is being sold in London on a guaranteed minimum weight (and quality). in place of f.a.q. samples, as is done with Australian wheat. This is the alteration that has been suggested by Professor Lowrie, and approved unanimously by the members of the Agricultural Bureau in Conferences at Gladstone, Quorn, Bute, Mannum, and Strathalbyn—that is, that there shall be a permanent standard of quality, free from bunt and rubbish, and weighing not less than 64lbs. (or 65lbs.) per bushel; second grade to be clean grain, weighing not less than 61lbs. per bushel.

On March 28 the Governor in Council approved of a new by-law, providing for reduced rates for the carriage of wheat, other cereals, potatoes, and live stock on the railways. This by-law, which will come into force on April 2, represents a reduction of from 10 to 15 per cent. upon the old rates for the carriage of wheat, and is practically a continuation of the special reduction made at the beginning of the year, which would lapse in the ordinary course on March 31. The by-law fixes a general rate which will apply to wheat, barley, bran, flour, maize, maizemeal, oats, oatmeal, pollard, rye, wheatmeal, and potatoes in lots of 3 tons or over. The freight under the new by-law for wheat carried twenty-five miles will be 3s. 8d. per ton, the same as the old charge; for fifty miles, 5s. 9d., as against 6s. 9d. old rate; for 100 miles, 9s. 5d., compared with 10s. 11d.; and for 200 miles, 14s. 9d., as against 16s. 2d. Hay, straw, and chaff, hydraulic or steam pressed, have hitherto been carried at cereals rate, less 10 per cent., but under the new arrangement the percentage reduction has been abolished, and the general rate only will apply.

The series of articles on the pruning of fruit trees, by Mr. George Quinn, which have appeared in the *Journal* during the past few months will be published in pamphlet form within a few days, and copies can be obtained from the Agricultural Bureau office at 1s. The pamphlet consists of 115 pages, and contains 118 illustrations, mostly from nature, and will prove very useful, especially to beginners.

Great losses have been sustained by farmers in South Australia, and Victoria through bunt in wheat this present season. This has been attributed to many causes, but the purity of the bluestone has borne the chief blame. It is improbable that the bluestone is the cause of the trouble, because of many samples already procured from various parts of the colony there does not appear to be one that is really adulterated. The cause of the bunted crops is more likely to be re-infection after pickling, by means of the bunt balls remaining with the seed and becoming broken when passing through the seed drill. All seed wheat should be passed through a blower before being pickled, then pickled in baskets immersed in a solution of 1½lbs. to 2lbs. of bluestone in 10galls. of water. See that the whole of the bluestone is dissolved. The solution does not become weaker through soaking wheat in it.

On Yorke's Peninsula, as well as in many other parts of South Australia, there are considerable patches of saline soils where no plants useful for stock grow naturally. Such lands could be made to produce a good deal of fodder if cultivated for mangolds, beets, or some of our indigenous saltbushes. Atriplex nummularia will grow where the samphire thrives, and produces a deal of fodder. It can be propagated easily from cuttings, which can be planted out, and it will grow from seeds just barely covered with soil. Atriplex semibaccata will grow in very saline soil, or on dry limestone rubble, and is so much liked by live stock that they eat it out, roots and all.

A good deal of discussion has taken place with respect to botflies and gadflies. It has been stated that the botflies attack cattle only, and cause swellings and sores on the skin (which are called "warbles"), whilst the gadflies attack horses, and that the larvæ (which are called "bots") live in the intestines of the animals. In Europe the flies which attack cattle are called "warble-flies," and it is they which cause numerous boils or swellings in the hide. Each maggot causes a quantity of pus to be produced in the skin, and in time the maggot develops a fly. The gadflies stick their eggs on the hair of the knees of horses, or other parts that can be reached by the mouth of the animal, and the irritation set up by the eggs or the maggots causes the horse to bite or lick them off, and they find their way into the stomach, where they assume the form called bots. The warble-fly, the botfly, and the gadfly are closely related.

Mr. J. H. Wilhelm, of Mannum, who has lived in rabbit-infested country fourteen years, says poisoning of rabbits with strychnine water is dangerous to cats, dogs, and all other animals. He has used poisoned wheat with great safety and success, even when green grass was plentiful and at its best. He dissolves ¾oz. of Blundell's strychnine with a little acetic acid or vinegar, boils 1½lbs. sugar and one tablespoonful of flour in 3qts. of water, stirring until sugar is dissolved. Then mix the whole with ½bush. of wheat. This is best done with two kerosine tins, pouring the wheat from one to the other several times. Use a spoon to scatter the poisoned wheat wherever rabbits exist, and they are certain to find it. Dogs, cats, horses, and cattle are safe, but sheep and poultry must be kept out of any paddock where the poison is laid.

There seems to be bright prospects for pigbreeders in the near future. Two large bacon factories are to be established, one at Mount Gambier and another probably near Port Adelaide. The companies about to start these are both powerful, and able to pay the highest reasonable prices for pigs. With the low rates ruling for cereals and an average of 3½d. deadweight for pork it should pay better to exchange the grain with the pigs for pork than to sell to the merchants for cash.

Mr. Thomson, at Naracoorte, has 750 pigs on 500 acres of drift sandhills covered with ferns, made pig-proof. The sties are solidly constructed with sawn timber, chiefly scantlings from a sawmill. Water is laid on from an elevated tank, supplied by a windmill from a copious flow in a well of moderate depth.

An American authority states that manure from horses is worth twice as much as that from cows and pigs. Give the horses plenty of oat straw, and let this become fully saturated with their urine before throwing out. This makes the best of all manures for all purposes, but this should not be allowed to heat and burn in piles. Manures of less value, such as cow and pig manure, wood ashes, decayed vegetables, shavings, leaves of trees, in fact any rubbish that will rot, can be mixed in with the horse manure, the whole being forked over several times to get well mixed. It is generally best to spread manure in the autumn, and plough in. Coarser manure can then be used than if delayed until spring. Where manure is to be used as a top-dressing for grass, clover, and strawberry beds it is also best to spread on in the autumn, as it affords protection to the roots of the plants.

Every farmer who has no Chinaman's or other market garden close by should establish his own vegetable and fruit garden; and, if he loves his wife and children, should also give them the opportunity to grow some flowers. Vegetables and fruit are absolutely essential to good health, but the stuff sold by some hawkers and shopkeepers has often been so long out of the garden, and has been mauled about so often by would-be purchasers and others, that it is not just as nice and fresh as it ought to be. The farmer can generally save plenty of manure for his garden, at any rate, and he can use his team, plough, scarifier, and harrows to do the heaviest part of the work, and can reserve a larger piece of some of his best land for the purposes than a cottager could do. Those farmers who are sufficiently enterprising to start a garden now can gain valuable hints from the reminders published monthly in this journal under the pen of Mr. George Quinn, Government Horticultural Instructor.

FUNGUS DISEASES OF CITRUS TREES IN AUSTRALIA.

The Victorian Government Vegetable Pathologist (Mr. D. McAlpine) has just added another claim to the gratitude of Australasian horticulturists and scientific investigators by the publication of a work of 132 pages, with 186 figures and twelve most faithfully-colored plates of the fungus diseases affecting citrus trees in Australia, together with recommendations with regard to the treatment and cure (where cure is known) of those diseases. The first part of this valuable work consists of a general description of the principal diseases and their treatment, written in popular language which every horticulturist can understand, and the second part gives the technical or scientific descriptions of the various fungi found on citrus trees in Australia; and these will enable any scientific botanist to identify examples that may come under his attention. Finally there are instructive appendices dealing with the varieties of citrus grown in Australia, treatment of plants with hydrocyanic acid gas, quantity of oranges and lemons imported, explanation of plates, index of common and scientific names of fungi, and a chart of diseases and their treatment. Great credit is due also to the Victorian Government Printer for the excellence of coloring in the plates and the general printing, and also to the artist, Mr. C. C. Brittlebank, who made the colored drawings.

ORCHARD NOTES FOR APRIL

By George Quinn, Horticultural Instructor.

When the harvesting of the late apples and pears is concluded, attention should be directed to the opening up of the now trampled soil around the trees to catch and retain the rain from the earliest showers of winter.

In dry districts it is absolutely essential that *all* of the rain should soak into the soil, and in wet, hilly localities it often happens that the soil becomes sloppy if the early stages of winter are allowed to pass without ploughing or digging the surface of the orchard. In sandy, loose, deep soils the urgency is not so great, but in soils underlaid by strata which but slowly admit the downward passage of moisture some provision is necessary.

Owing to the ravages of birds and other pests, the apples and pears are being picked very early, and disposed of by some growers at once.

In sorting out the apples and pears for storing too much care cannot be exercised in separating all damaged fruits. This will save a lot of trouble afterwards, as good, sound apples may safely be stacked a couple of feet deep on the floors or shelves of the store without decaying specimens proving a source of anxiety and loss.

Pears require much more careful manipulation than apples. Unless the skin of an apple is brought in contact with a sharp surface it is not readily broken. If only slightly pressed, the skin and surface cells will lose moisture from that spot and dry up, thus staving off the action of destructive organisms. The skin of the pear is less elastic and punctures very easily in the green stage, while at the ripened condition the skins of many kinds of pears seem to become almost granular.

I would urge once more upon our growers the need for more care being taken in the construction of their fruit stores, particularly in respect to rendering them moth proof, so as to be in a position to entrap all codlin moths that may develop from the caterpillars put away unintentionally in the store fruits.

Citrus trees could be planted out now, where the places are prepared for them; but as they are now making young shoots there is much doubt respecting the value of setting out these trees in autumn.

The soil should be prepared now for planting deciduous fruit trees next month, and in cases where young trees are to fill gaps among older trees the soil and subsoil should have been exposed all the summer to aerate it thoroughly. This is usually done by opening out a large hole 4ft. or 5ft. square for a couple of feet deep, picking up the bottom and leaving it in a rough state.

Those intending to raise a few seedlings for working desirable varieties upon should see about planting the stones or pips now. All of these germinate better if planted before the shells have become dried up.

The ties upon lately budded trees will require careful attention, and where a good union has been effected they may be first loosened and afterwards removed. The top growth of the stock above the "bud" *should not be severed now.*

During April sprayings with resin wash have proved very effective upon the red scale of the citrus tribe, and at this advanced stage no damage is likely to accrue to the fruits if the trees are supplied with soil moisture. If this is followed by another good dressing early in May not many living scales will be left to disfigure or stop the sale and distribution of these fruits. A good spray formula is as follows:—1lb. resin, 1lb. washing soda, ½lb. soap to each 5galls. of water. Before using this or any spray upon citrus trees any accumulated dense water shoots should be removed from the centre of the trees.

The attacks, or rather season of activity, of the codlin moth will fairly cease during this month, but care should still be given to the infested fruits and the bandages around the tree stems, so that as great a reduction as possible may be made of this pest. Intending planters should bespeak trees at once.

DESTRUCTION OF MOSS.—Some few years ago complaints were made in one of the Hills districts that considerable areas of good pasture land were being ruined by the spread of moss. Some interesting experiments have been carried out at Wye Agricultural College, England, to destroy the moss growing on the pastures. Sulphate of iron dissolved in water at the rate of 1lb. to 20galls. caused the moss to turn brown and appear crumbly, but the effect was not lasting. The grass was uninjured by this treatment. Salt applied at the rate of 320lbs. per acre, applying it in water, appeared to be beneficial; dressings of superphosphate also had a favorable effect. Lime, Thomas phosphate, and sulphuric acid had no appreciable effect. Rolling produced a slight beneficial effect; raking or harrowing occasionally destroyed a lot of the moss. Ammoniacal liquor from the gasworks and gas lime would probably destroy the moss.

BEES AND FRUIT.

The prejudice of the fruitgrower against his best friend, the honey-bee, is fast disappearing; but through ignorance in another direction he causes the deaths of countless numbers of the busy workers. A most carefully executed experiment by Professor A. J. Cook is reported in the *American Bee Journal.* In each case an equal number of blossoms were selected from adjacent branches. One lot was marked with a tag and the other surrounded with cheese cloth. These, without details, are the results as to fertilisation:—

	Blooms.	Covered Fruits.	Uncovered Fruits.
Apple	40	0	15
Crab-apple	200	0	3
Pear	140	0	7
Cherry	300	9	119
Strawberries	60	9	27
Raspberries	184	93	160
Clover, red	10 heads	0	191
Clover, white	10 heads	0	541

A further experiment was to take two plum, two cherry, and two pear trees. On each tree three lots of blossom were selected. One lot was left uncovered, the second lot was covered, but bees were introduced under the covering, and the third lot was covered, excluding all bees. In no case was there fruit on any twig from the blossom of which the bees were kept. This was the result:—

	Covered.	Bees Enclosed.	Not Covered.
Plums	0	3	8
	0	5	4
Cherry	0	5	7
Pears	0	6	8
	0.	8	1

A NEW DESSERT PEAR.

By George Quinn, Horticultural Instructor.

Some time ago, when visiting his orchard at Belair, Mr. G. R. Laffer drew my attention to several seedling pear trees which he had raised. They are just coming into bearing now, and have produced a fair quantity of fruits this season. One tree of moderate proportions and thrifty habit strongly resembles the well-known "Winter Nelis" in foliage and spur formation. This tree has borne a good quantity of fruit this season, and Mr. Laffer has been good enough to leave a box containing several dozens of fruits at the Agricultural Bureau office for the purpose of testing the quality as they ripened. I have thoroughly sampled the quality of the fruits, and have also submitted them to some of our leading growers and others competent to judge their flavor. All have pronounced the flavor first class. Coming in at the time when the supplies of William's Bon Chretien (the "Duchess" of our trade) are failing in the markets, this variety should prove a valuable acquisition to our orchards.

The fruits are medium large, somewhat obtuse pyriform, and irregular in outline. The skin is fairly smooth and green at first, but as it ripens turns to a clear, pale yellow. Thus far it tallies closely with William's Bon Chretien. The skin is dotted all over with small russet specks. Over a large proportion of the surface these russet specks merge into continuous flecks and blotches of bright russet, giving the fruit a very attractive appearance. The eye is set in a deep, smooth, regular cup-shaped basin, lined with russeting. The eye is fairly open, and the calyx leaves low, erect, and continuous, forming a distinct cross. The stalk is from an inch to an inch and a half long, fairly stout, curving towards the less rotund side of the fruit. It is inserted in a pretty deep irregular cavity.

The flesh is white, tender, sweet, and melting, and the core is very small indeed, and the seeds and fibrous surroundings could be covered by a shilling piece. The contour suggests the William's Bon Chretien as a parent, and the color and flavor, very strongly supported by the foliage and slender abundant spurring habit of the tree, recalls the Winter Nelis as another. A slight grittiness through the melting flesh faintly suggests the Bergamot strain. The raiser cannot be too strongly urged to propagate the variety and give it a good trial, and the General Secretary of the Agricultural Bureau has suggested that the fortunate raiser should be prevailed upon to sink his natural modesty and allow it to be called "The Laffer," if further trials prove that it is worthy to be placed alongside our standard named varieties.

NOTES ON VEGETABLE-GROWING FOR APRIL.

By George Quinn, Horticultural Instructor.

The rains which fell in March over a large area of the colony have engendered hopes of a good season for vegetables. The early-sown crops of peas, carrots, and parsnips have started away with healthy prospects, and young plants of cabbage and cauliflower are making good progress where green caterpillars have not obtained control.

All kinds of cabbage, cauliflower, broccoli, kohlrabi, lettuce, onion, celery, and Brussels sprouts can now be successfully planted.

With respect to all kinds of the cabbage family which are transplanted much loss can be averted during an average season by immersing the young plants in a solution of tobacco and soap prior to setting them out. This will usually destroy small caterpillars and a few lurking aphides which would pass unnoticed just now, but which would probably ruin the plants at a later stage, particularly if dry spells of weather occur. These plants, after being dipped, should be allowed to drain for a few minutes and then the roots could be washed in clean water prior to planting them out.

All growing crops, with the exception of peas, will be greatly benefited by a top dressing with a quickly-dissolving manure, such as sulphate of ammonia. Superphosphate will benefit all. These fertilisers should be sprinkled along the rows—not on the plants—and hoed or forked in lightly. It is a good plan to apply them when rain is pending.

Sowings should be made in drills of peas, beans (broad), carrots, parsnips, onions, cresses, lettuces, radishes, spinach, turnips of all kinds, red beet, and parsley It is a very good plan to cover the seeds with finely-pulverised manure mixed with about one-third loam and a small quantity of superhosphate. Keep the soil between the rows moved with hoe or fork to aerate the soil and stimulate root action. If this is not done the surface becomes compacted and waterlogged in most soils, and in this condition root activity is reduced to a minimum.

These early winter crops of vegetables should be planted upon the slopes facing the sun, if the garden is undulating; and if flat, all shading objects, such as fences, hedges, or trees should be avoided as far as practicable.

In districts seldom visited by frosts potatoes may still be planted.

Beds of rhubarb and asparagus should be mulched with well-rotted farmyard manure, and a handful or two of salt to the square yard will benefit the latter.

If time can be spared, ground should be trenched roughly for planting these crops later on.

Good pods on kidney beans should now be reserved for seed purposes, as these plants fail to bloom as soon as the air and ground becomes cold.

Tomatoes should be exposed to the sun now as much as possible by turning the bushes over, tying them up, or cutting out dense foliage. Cuttings of good kinds could be secured now for perpetuating any very desirable kind. This is the only certain method of securing exact sorts.

Pumpkins, marrows, trombones, and pie-melons should be collected and stored in a cool, dry place before the ground becomes too sodden about them. Cucumbers should be saved for seed purposes; and, if early fruiting plants are required, the grower should always have seeds about three seasons old on hand, as these do not produce such vigorous plants, but set earlier fruits, as a rule

Thin out growing crops of carrots, parsnips, turnips, beet, spinach, onion, radish, &c., before they become drawn and sickly.

Take up and divide herbs, replanting young offsets only.

Look out for slugs and snails. The former can be worked out by dusting the beds with lime every evening for about ten days. The latter can be collected after a shower, and harboring bushes should be kept clear.

GROWING POTATOES ON THE SURFACE.

It is not generally known by small growers that they can raise good clean crops of potatoes on the surface of the soil. First it must be remembered that the potato of commerce is not the root of the potato plant, but a tuber containing stored-up food. The real roots, which are fibrous and branched, are produced below the tubers, and provided they have the soil to grow in and plant food available the plants will flourish and produce tubers under certain conditions. The late Mr. G. S. Fowler on several occasions grew good crops of potatoes by a similar method to that now described. Break up the soil, and work it down fine, manuring it with stable manure or chemical fertilisers. Plant the setts on the surface, and press them into the soil until half buried, or just cover them with light soil; then cover the plot with straw, grass, or similar material to depth of 2ft. to 3ft., and keep it moist. The potato stems will grow up through the straw, &c., and produce tubers in the lower layers. The straw must be kept moist. An old method of producing a constant supply of tubers is described as follows:—Place the setts about 6in. apart each way, build round the plot a pen with rails several inches apart, cover with straw to depth of 3ft. or more, and throw over it a few buckets of water occasionally. The tubers produced can be removed as far as the arm will reach through the crevices from time to without seriously disturbing the plants. A large quantity of smooth, clean potatoes of good quality can be raised on a comparatively small area by this means.

POTATO EXPERIMENTS.

By W. L. Summers, Inspector of Fertilisers.

Last season several of our public school teachers carried out experiments in the cultivation of potatoes under suggestions from the writer, in some cases seed and manure being supplied by the Department of Agriculture. Owing to the frosty weather in October and November, and the dryness following, the results were not altogether satisfactory, but a few notes from reports of two of the teachers will be of interest.

Mr. T. G. Roberts, of Aldgate School, had about ten manured plots 16ft. x 25ft., the rows being 2ft. apart, and the potatoes 1ft. apart in the rows.

Owing to unforeseen circumstances, the results were too variable to permit of fair comparison of the effects of the different fertilisers used. The idea of the tests was to ascertain which form of phosphate was best for this particular locality, and also to note the effects of nitrogen and potash being given in addition to the phosphate. The largest return was obtained from a plot manured with 6lbs. bonedust, the yield being 112lbs. The plot manured with 3lbs. bonedust, 2½lbs. super., 2lbs. nitrate of soda, and 1½lbs. muriate of potash, yielded 109lbs., while the plot receiving 6lbs. of bonedust and 1½lbs. muriate of potash yielded 100lbs. When both quality and quantity were taken into account, the two latter were decidedly superior to the plot manured with bonedust alone.

Mr. J. Jacobs, of Mount Schanck School, carried out tests in manuring, and with new varieties of potatoes raised from setts imported by the Chairman of Central Bureau (Mr. F. Krichauff) from Germany. Here again conditions were against a satisfactory test, the plants being cut two or three times by frost; once, when about 9in. high, they were cut right down. The soil is strongly volcanic at the foot of Mount Schanck, is extremely light, loose, and dry, and being low is also very frosty. The plots were small, and half received manure at rate of 600lbs. super. and 200lbs. sulphate of ammonia per acre, besides a good dressing of wood ashes. The setts were planted on August 25, and dug on March 5. The following table shows the results, the manured plot in each case being marked F :—

Variety.	Weight of Setts.	Marketable Potatoes.		Small Potatoes.		Remarks.
		Per Plot	Average per Acre.	Per Plot	Average per Acre.	
	lbs.	lbs.	tons.	lbs.	tons.	
Eyth—F	¾	3	1·85	4	2·36	Pink skin, very nice shape, but straggly.
Do.	¾	2½	1·54	4½	2·77	
Prof. Maercker—F	⅞	5½	3·96	1	0·72	White potato.
Do.	⅞	4	2·88	2	1·44	
Wohltmann—F	⅞	8	4·93	3	1·84	Pink.
Do.	1⅛	7	3·78	4	2·16	
Korn—F	⅞	9	6·48	3½	2·52	White.
Do.	⅝	3½	3·02	2½	2·15	
Ehlers—F	1	9¼	7·99	1½	0·43	White, very good.
Do.	1	8	5·76	1	0·72	
Thiele—F	⅞	10¾	6·63	1	0·71	White.
Do.	⅞	6	3·07	1	0·71	
Gratia—F	⅝	6	4·32	5	3·6	Pink, roots intersected.
Do.	⅝	4	2·88	3½	2·52	

It will be noticed that in every case the fertilised plots yielded more marketable potatoes than the unmanured, while the proportion of small potatoes was less. Taking the total of the whole plots, those fertilised yielded 51½lbs. good potatoes and 18lbs. small, against 35lbs. good and 18½lbs. small from the plots not fertilised. Of the varieties, Ehlers, Korn, and Thiele gave far the best results, and, with the exception of Eyth, the results were all above this season's average for the district. The tubers were all shapely and free from scab. Red Skin and Brown River potatoes were tried in small plots with and without wood ashes, the result being that the plots without the ashes did slightly better than those so treated.

A report has recently been issued upon the potato experiments which have been carried out at the Agricultural and Horticultural School belonging to the Cheshire County Council, England. The year 1899 is the fourth year in succession in which this class of experiment has been undertaken, as it is found that this continuance is necessary to verify previous results or otherwise. The conclusions arrived at are briefly summed up as under:—

1. There seems to be very little difference between planting whole setts and cut setts, but, if anything, the average results of the last four years are in favor of whole setts.
2. That large seed is more profitable to plant than small seed.
3. That an artificial manure containing nitrogen, phosphoric acid, and potash in suitable proportions will increase the yield considerably over no manure.
4. That farmyard manure will produce much better results than artificial manures alone. This is probably due to the mechanical influence that farmyard manure has upon the soil.
5. That the best results are again obtained from 3cwts. superphosphate, 1cwt. sulphate of ammonia, 1cwt. muriate of potash, and 15 tons of farmyard manure.
6. That manures have a considerable influence upon the size and cooking quality of the tubers.
7. That sulphate of ammonia seems to be the best form in which to apply nitrogen to potatoes.
8. That muriate of potash produced better results than either kainit or sulphate of potash.
9. The yield per acre this year is less than last year's in almost every variety of potato tried.

The annual report of the Ontario Department of Agriculture for 1898 contains some interesting notes on experiments with potatoes. One hundred and eighty-three varieties have been grown for three years or more on plots of 1·100th of an acre. The yields vary to an astonishing degree, the average returns per acre for the three best being 226·19bush., 224·68bush., and 220·42bush. respectively, while the lowest averaged only 67·64bush. Forty-six varieties averaged over 200bush. per acre. The sixth on the list—Early Rose—is the only one of these grown to any extent in South Australia. This variety came second of the early potatoes in point of yield.

Experiments with regard to size of whole potatoes for seed have been carried out since 1894. Large, medium, and small marketable, and very small potatoes have been used, and the progeny selected year after year in the same way. The largest potatoes have invariably produced the largest return, the medium-sized next, then the small, and finally the smallest. When, however, the weight of the seed is deducted, the results were more nearly alike, and on the whole the medium-sized potatoes were probably most profitable. The percentages of marketable potatoes in the various plots were very nearly the same, but continuing to plant very small potatoes from plants grown from the same class of seed has resulted in the percentage of marketable tubers falling from 84·4 per cent. to 67 per cent. in four years.

It is frequently claimed that the size of the sett has more to do with the crop than the number of eyes in the sett, and experiments during four years bear out this conclusion. 2oz. setts with one eye giving 177·4bush. per acre against 152·5bush. from 1oz. setts, though the percentage of marketable potatoes does not appear to be affected by the size of the sett. A further experiment with 1oz. setts, with from one to five eyes each, showed that the setts with most eyes gave the highest returns, but the returns did not vary to anything like the same extent as in the previous experiment. As the 2oz. setts give the best results with single eye, it would have been interesting to have continued the experiment with 2oz. instead of 1oz. setts. It has also been found that setts cut and planted the same day yield better than setts cut and left several days before planting, and also give a higher percentage of marketable potatoes. On this point, however, very much will depend upon the condition of the soil, *i.e.*, whether wet or dry, light or heavy.

ADVICE TO SOUTH-EASTERN DAIRYMEN.

ADDRESS AT LUCINDALE CONFERENCE BY MR. G. S. THOMSON, DAIRY INSTRUCTOR.

Progression in dairy-farming is very evident throughout South Australia, and farmers are recognising that the industry is a very remunerative one when the work of the farm and the dairy is conducted on approved and systematic principles. Around Mount Gambier the fertility and consistency of the loam is ideal for the production of abundance of green food and root crops for milking stock, and such a soil affords unlimited scope for the energies and skill of the modern farmer. Speaking upon the possibilities of the South-Eastern soils Professor Lowrie had quite recently expressed the opinion that much could be done in the way of growing green food, and more especially mangolds, as food for all classes of farm stock. It appears that the qualities of the mangold as a valuable food for dairy cattle are not thoroughly appreciated to encourage farmers to devote attention to their growth. No finer root food for milk production can be cultivated than the mangold, and at the period of the year when maturity has arrived cows will especially benefit from the nutriment contained. To those who have got the mangold under cultivation it might be well to point out that the feeding value of the bulbs is low when the mangold is at full growth, maturity only being attained after the crop is pulled, put into heaps, covered with earth, and left for several months to ripen.

As education in our colony extends advance will be made in the way of growing varieties of foods to suit the different districts where dairy-farming can be practised profitably. To note the great value of technical education to the dairy farmer we have only to view the position of Denmark in the butter market of the world. Denmark is our most formidable rival, not because the market of England is comparatively near her shores, but because Denmark has studied the profits of instruction, and has put such into thorough use throughout the entire country. It is true that scientific education alone when preached is next to worthless, but the Danes have established in their midst State farms and dairies where the valued practical work of the industry is open to the inspection of farmers, and it is from those seats of learning that the true dairy instruction is obtained. This is exemplified by the price Danish butter has commanded in the home markets when compared with the Australian product. Throughout the last export season deterioration in the quality of our produce was attributed to the presence of a fishy flavor in the butter. Observations which I have gathered during the Government butter test appear to show that the origin of fishiness is to be found in the quality of the feed. At present I am carrying out scientific research with a view to finding a clue to its entrance.

Concerning the South Australian export trade much has been said of the alleged severity and unjust treatment butter has been subjected to in the way of grading at the Government Depôt. There has been a very large quantity of really inferior butter shipped during the past season, and the result of this influx of low-grade butter has lowered the price of the good product and injured the reputation of the colony or colonies, as the same pertains to Victoria. Large quantities of pastry butter shipped in boxes bearing the name of a so-called factory, together with the words "South Australia," cannot do otherwise than stain the future of our butter industry The action of the Government in the way of grading is to protect the manufacturer of a good article, and at the same time is to try and uphold the reputation of the colony. If the Government brands are not recognised in London the sooner they are the better. I would recommend that the hot iron grading be done. It may be mentioned that the bulk of pastry butter shipped was not made in factories, but manufactured in Adelaide from mixed lots of cream or store butter.

CULTIVATION OF FODDER CROPS.

ADDRESS DELIVERED BY PROFESSOR LOWRIE AT LUCINDALE CONFERENCE.

The Professor said that, of course, they would understand that those who were called experts in the department, in coming to a district with which they were unacquainted, were at a considerable disadvantage, and in face of that they had to speak with more or less hesitation, but were satisfied if suggestions they then made led to discussion or argument afterwards. He proposed to speak of some matters which he thought could well be ventilated in a Conference of members of the South-Eastern Branches. He thought more could be done in this district with forage crops than was being done. It would be for them to correct him, and for him to hold up the end of his argument afterwards. They had conditions of soil in the South-East which he was sorry to say was not up to the best wheat-growing soil. At Mount Gambier they had the most favorable conditions, but he was speaking of the average as it struck him. If their soil was not equal to that in the North, they had what Northerners had not—a good rainfall, and that made up for any deficiency in the average soil. It admitted of the growth of forage crops, which farmers in the North could not hope to approach. The crops that occurred to him as deserving of greater consideration were mangolds, kail, rape, rye, and vetches, and, of course, they would not forget the much-patronised potato. The point to keep specially in view to make a success of these crops was that they should adopt deeper cultivation. He would not say "ploughing" where the subsoils were raw, but he would say deeper cultivation and more manure than for cereals. He believed that with dressings of manures there were many areas in the South-East where these crops could be grown, and on which sheep could be topped up. It was no rare thing to see South-East sheep realising high prices in the Adelaide market. They were selling up to 17s., and prices would undoubtedly get better. Sheep were sent to the market which might be called in fair fat condition, but they would not get that prime fatness which made the extra 2s. in the price without the growth of forage crops. He believed it would pay well, from the point of fat sheep alone, to have a block in kail and mangolds. This might be helped out with oaten chaff. For this purpose it was better to let the oats get riper than if they were being cut for ordinary hay. He believed this would pay much better than selling their oats at 1s. 6d. per bushel. He would not advise extreme methods of cultivation. The land here was comparatively cheap, and they could adopt cheaper methods than in older countries. They could afford to sow very much thinner than the men working in other countries where they went in for thinning out. He believed ¾lb. of mangolds to the acre could be drilled in here. With turnips they could put in even less, but he thought 2lbs. of rape per acre would pay better. Of all these crops he thought that of mangolds was one that deserved consideration, because it came in at a time when other forage was wanting. It might not be wanting this year, because we had had early rain. He would say it was a mistake to feed anything of that sort before it was ripe. Neither the bulk nor anything like the feeding quality was obtained, and if they were feeding dairy cattle they would get sloppy produce instead of firm, good quality butter. That was a point in favor of mangolds, and another was that they could be used for all kinds of stock. If given with a little grain or chaff there was nothing he knew of that would give better results in fattening. He thought the long red mangolds seemed to suit the district best. An advantage of kail was that it was down for one, two, or three years. He reckoned if a man put in a few acres in spring, in the early summer he might have it to finish up his lambs on. From the point of view of the lamb trade, the South-East had an advantage. In the North they found it best to get their lambs away in October. These lambs had been getting home at a time when London was not in the habit of getting lamb, and the London people were prone to think that it came off the hindquarter of a wether; consequently there was no demand for it. Lambs from the South-East got home in March, when everyone wanted to buy it, because it was dear and fashionable then. For lambs weighing 40lbs. they could get any price they wanted in February and March. He thought it a mistake to have the lambs dropped too early in the South-East, as they had to stand all the cold weather. With kail, if it was grazed off in the spring, it would live through the summer, and then, if they had rain like they had the day before in six weeks it would be rank luxuriant foliage. If they then turned in their wethers they could send them to Adelaide at the very best time. He thought they should make more use of rye than they did. He did not think they should attempt wheat in this district. If they were going in for cereals at all let it be oats. If they were preparing land for wheat a crop of rye grazed off would do it much more good than if it was simply left to fallow. He would grow late varieties of wheat, and sow early. If they were ambitious to grow wheat let them make a preparation with forage crop, and then they would get a crop worth harvesting.

CULTIVATION OF THE SOIL.

By J. F. Everett, Brinkworth Branch.

At the Conference of Southern Yorke's Peninsula Branches, held at Port Broughton in April, 1899, Mr. Everett read a paper to the following effect:—Land intended to be cropped with cereals should be fallowed first. This should be done as soon as possible after seeding, and finished by end of July. In our locality the ploughing should not be ploughed twice at the same depth; 3in. or 4in. would do for the first twice, and then 5in. the third time. When the season is dry and the land is ploughed too deeply it is almost impossible to get the soil firm enough beneath. You may work it down to a fine tilth on the surface, but if good winter rains do not fall the soil beneath will be loose, hollow, and cloddy, and this is anything but a favorable condition for the healthy growth of the wheat plant. After the ploughing it is advisable to use light harrows to level the surface, and the sooner this is done the better if the soil is moist enough; else it may happen that dry weather sets in, and it is not possible to do this necessary work. If this is done by the end of July it will be possible to cultivate the land occasionally before hay harvest. It is desirable that sheep should be run on the fallow now and again to nip off any weeds. If the land is very wet do not go on it with the scarifiers, as this will cause it to cake and become cloddy. By crossing the ploughing with the scarifier better work is done in cutting up weeds and levelling the ground. After the scarifier the scarifier-harrows should be got to work to make a solid bed; choose fine weather for this work. With two teams of five horses and two sets of harrows of three leaves from thirty to forty acres per day can be covered On mullenised land, of course, the scarifier-harrows cannot be used. If heavy rains should occur after harvest it will be advisable to scarify and use the scarifier-harrows to cut up cockspurs and other weeds; but not so if the weather continues dry. After the middle of March or beginning of April is soon enough to prepare for seed sowing. If good rains fall about then, set the cultivating implements at work and keep them going until the middle of April, when seeding should commence on the portions already scarified and harrowed.

After seeding run the scarifier-harrows over, and, if needed, the ordinary harrows also. When this is finished sow the rest of the land before the scarifier, and follow with the light harrows. If the weather is dry run the roller over as much of the land as is possible. The foregoing remarks apply to seeding with hand or with the broadcast seedsower.

BLUESTONE FOR PICKLING WHEAT.

In consequence of the many statements by farmers that the presence of so much bunt last season in the wheat crops was due to the sale of inferior bluestone, the Central Agricultural Bureau decided to have a number of samples tested. About twenty different Branches in the principal wheat-growing districts were asked to send in samples taken from parcels of bluestone purchased in the ordinary way for pickling purposes. So far ten Branches have sent in samples, some of which have by exposure to atmospheric action become partly dehydrated—in other words, portion of the water has evaporated—and instead of being in crystals, consisted partly of crystals and partly of a whitish-blue powder. Some of the samples were in large crystals, others medium size. The latter are best for use for pickling as they dissolve much more readily than the large crystals.

The following are the results of the analyses of samples received:—

Sample from—	Result of Analysis.
Gawler River	63·8 per cent. sulphate of copper, equivalent to 99·9 per cent. crystallised copper sulphate
Port Pirie	62·2 per cent. sulphate of copper, equivalent to 98·2 per cent. crystallised copper sulphate
Port Pirie (old sample)	67·2 per cent. sulphate of copper, equivalent to 104·8 per cent. crystallised copper sulphate
Carrieton	63·7 per cent. sulphate of copper, equivalent to 99·7 per cent. crystallised copper sulphate
Koolunga	63·2 per cent. sulphate of copper, equivalent to 98·9 per cent. crystallised copper sulphate
Mount Bryan East ..	63·9 per cent. sulphate of copper, equivalent to 100·1 per cent. crystallised copper sulphate
Mount Remarkable ..	63·6 per cent. sulphate of copper, equivalent to 99·7 per cent. crystallised copper sulphate
Quorn	63 8 per cent. copper sulphate, equivalent to 100·0 per cent. crystallised copper sulphate
Yanyarrie	61·9 per cent. copper sulphate, equivalent to 96·4 per cent. crystallised copper sulphate
Mundoora	59·4 per cent. copper sulphate, equivalent to 93·1 per cent crystallised copper sulphate
Lipson	55·6 per cent. copper sulphate, equivalent to 87·0 per cent. crystallised copper sulphate
Appila-Yarrowie	58·0 per cent. copper sulphate, equivalent to 90·9 per cent. crystallised copper sulphate

In explanation it may be stated that bluestone (crystallised sulphate of copper) consists of 63·87 per cent. of sulphate of copper combined with 36·13 per cent. of water. By exposure to the atmosphere a certain proportion of the water in time evaporates, while the sulphate of copper is unaffected; hence the apparent inconsistency in the statement that some of the samples contained sulphate of copper equivalent to more than 100 per cent. of crystallised copper sulphate.

It will be observed that, with the exception of the last three samples, no objection can be taken to the quality of the bluestone as represented by the samples sent to the Bureau office. The sample from Mundoora contains 4·47 per cent. less sulphate of copper than the chemically pure bluestone; the sample from Appila-Yarrowie, 5·87 per cent. less; and from Lipson, 8·27 per cent. less. The two latter samples contain, in addition, a considerable amount of basic sulphate of copper, insoluble in water, and consequently valueless for pickling purposes. Outwardly the sample from Lipson was the worst looking of the lot, but was stated to be fairly representative of the bluestone sold in the district If the results of these analyses can be accepted as fairly representative of the quality of bluestone sold in South Australia—and, seeing the width of country from which they have been obtained, they should be—it is evident that to faulty methods of pickling, rather than to any fault with the pickling material, was due the prevalence of bunt last season in the wheat crops.

POULTRY NOTES.

By D. F. Laurie.

One often hears the question, "Which variety of fowl lays the most eggs?" This is a matter of general interest to producers, poultry-breeders, and housekeepers in general. On various occasions I have pointed out that experience has taught the scientific poultry specialist that laying is more a matter of strain than breed. This point cannot be too strongly emphasised, as therein lies the chief factor of success, and consequent profit. There are certain breeds, such as Minorcas, Leghorns, Andalusians, Anconas, Spanish, Hamburgs, &c., which are celebrated for their laying powers; the reasons for this are to a certain extent obscure, but there can be no doubt that the general contour and characteristics of typical specimens of the various breeds show that a bird of certain character at one time stamped itself as a layer, and fortunately the tendency was to perpetuate this type. It is possible that the reason why the egg-laying powers of the Mediterranean breeds are so conspicuous may be that the frugal producers of those parts found it more profitable to produce and ship eggs to another part, than to eat the fowls which produce them. On the other hand, the frequent mention of table poultry and capons in fiction and in history may account for the excellent table qualities of the Dorking and Old English Game. However, the fact remains, as regards egg production, the Mediterranean breeds have established a name. It is possible from common barndoor fowls to raise, by careful selection, a fine strain of layers of no particular breed. It has always been admitted that the quicker way is to use for the foundation specimens of some of the acknowledged pure laying breeds. In many cases one meets Leghorns, Minorcas, &c., which do not lay well; as a rule, if they are pure, the pullets resulting from a cross between two pure breeds, the hens of which have proved themselves poor layers, will nearly always be found to have regained the lost laying powers of both breeds. This is why crossbreds are generally good layers, and further accounts for the fact that most of the new breeds are good layers. The judicious combination of blood which went to make up the new breeds generally resulted in reviving the laying powers. Until the true value of artificial selection (*i.e.*, the choosing of sire and dam for mating) is understood we need not hope for any sterling improvement in the poultry of this colony or elsewhere. It is a common practice to refer to the excellence of continental poultry. Well, we have the authority of some of the leading poulterers of London for saying that, so great is the influx of very low class foreign table poultry that it will not pay to send any but the best to England. At the same time credit is undoubtedly due to continental, more especially French, breeders for the fact that certain districts are celebrated for a definite class of bird, and few deviations from the general type of the district will be found there. Houdans, LaBresse, LeMans, and others are almost peculiar to certain districts, and are undoubtedly the result of artificial selection. A type has been decided upon and perpetuated until we find all the birds of the district stamped with a certain individuality. The same remarks apply to the ducks to be found in the Vale of Aylesbury; they are not all show birds—very few in fact are; but the general type is one common to the district. Thus we can see that the leading characteristics of a breed or strain can be perpetuated, accentuated, and even more or less permanently fixed at the will of the intelligent breeder. Thus if one has a flock of hens which are, as a rule, not satisfactory, but one finds a hen which lays consistently throughout the year, her eggs alone should be incubated, and, if possible, it is preferable that she be mated with a male bird the progeny of a similar good layer. The eggs of a really good layer of fine eggs are far too valuable to sell except at high prices; they should all be incubated and no others. When once you have established a good flock of high-class layers lose no time in carefully culling them; it is false policy to keep even one poor layer, no matter how well she looks. If she is of a heavy breed and suitable for crossing for table bird production it will probably pay to put her to such use or sell her for a like purpose.

The matter of increasing the egg-laying powers of ducks has only received spasmodic attention from specialist writers. I may modestly claim to have first brought before the Australian public the advantages and desirability of the introduction of the Indian Runner ducks. I have seen many strains of common ducks which excelled, some to a remarkable extent, as layers. Some strains of Pekins and Aylesburys have also proved very excellent. I have indicated in lectures and otherwise the method to adopt in order to produce a duck large in frame yet fairly fecund. For table bird purposes, and especially for export, we require a bird which will give us as progeny a duckling which will plump up and mature at the season we most require, so that it can be shipped as really prime duckling. To this end I should advise a cross between moderate-sized Pekins or Aylesburys and Indian Runners. Select the finest specimens and cross back on unrelated specimens of the original, be it Pekin or Aylesbury. The final result will show that the size is in no way impaired, but the laying powers will be greatly increased, and without a doubt an earlier maturity will also result, with increased vigor and good constitution. Naturally these crosses must be carried out intelligently and with pure specimens of the various breeds in question.

For trials and comparisons of the egg-producing and profit-giving qualities of the various breeds to be of any value we must go to the trouble of selecting the best-known specimens as layers of each breed. They must be all housed alike and must be fed on similar food. But, as a rule, many make the mistake of allotting an equal quantity of food to each bird or flock. For preference I would give each flock what it required, and by keeping careful accounts we might find that a certain breed returned a greater or less value of eggs for a certain value of food, &c., expended. When we have a few trials of this description we can begin to talk breed *versus* breed.

THE KOHLMEISE OR GREAT TITMOUSE.—Some months back it was confidently stated that this bird had been proved to be of great benefit in destroying codlin moths. It is now stated, however, that there is no satisfactory evidence that it ever feeds upon the codlin moth, while in England it destroys large numbers of smaller birds, and also injures pears, apples, and figs. In Great Britain this bird is very prevalent, but it does not even hold the codlin moth pest in check.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

During the past month large shipments of fertilisers, principally superphosphates, have come to hand. All these have been sampled by myself for analysis, and up to the present not a single unsatisfactory result has been obtained. Up to the end of March over 17,000 tons of fertilisers have been imported, and several thousand tons are now on the way, so that it is not unlikely that when the season is ended it will be found that quite double last season's tonnage will have been imported. Nearly all the manure still to arrive has been sold, and several of the importers have had to refuse orders. Prices have risen, and those who neglected to order their supplies early will not only find some difficulty in placing their orders, but will probably have to pay considerably more for what they want.

In the following table the results of the analyses of various samples obtained by myself are given. Some vendors show the nitrogen in bonedust, &c., as ammonia. In order to compare the results shown with the guarantees the percentage of nitrogen should be multiplied by 1·214 to give its equivalent as ammonia.

Name of Vendor.	Fertiliser.	Water Soluble Phosphate.	Citrate Soluble Phosphate.	Acid Soluble Phosphate.	Nitrogen.	Potash.
F. H. Snow	Mineral Super. (Sheep Brand)	37·27*	—	—	—	—
Clutterbuck Bros. ..	" "	37·27*	—	—	—	—
" ..	" (United Alkali)	37·55	—	—	—	—
Elder, Smith, & Co.	" (Lawes')	38·05*	—	—	—	—
Norman & Co.	" (Reliance)	38·8	—	—	—	—
Geo. Wills & Co. ..	" (United Alkali)	36·5	—	—	—	—
S.A. Farmers' Union	" "	37·76	—	—	—	—
A. R. B. Lucas & Co.	Bally Bonedust No. 3	—	—	54·1	3·68*	—
" ..	" No. 4	—	—	53·93	3·75*	—
" ..	" No. 5	—	—	40·69	3·12*	—
Baker & Co.	Standard Bonedust	—	—	31·0	2·72†	—
F. F. Clement ...	" (Baker & Co.'s)	—	—	39·29	3·26‡	—
L. Mehrtens & Co...	Bonedust	—	—	40·82	4·6	—
Do. ..	Bone Manure	—	—	11·13	4·35	—
Adelaide Chemical Works	Guano Super.	14·48	15·66	7·79	1·04*	—
" ..	Bone Super.	14·47	16·84	6·8	2·9	0·26*
" ..	Complete Manure	22·92	6·44	7·09	0·64	0·4
" ..	Super. B	21·83	7·42	6·77	0·59	—
Charlick Bros.	Standard Bonedust	—	—	45·41	4·03	—

* Average of two or more analyses.

† Official analyst reports—"This sample is adulterated, with a large proportion of shells."

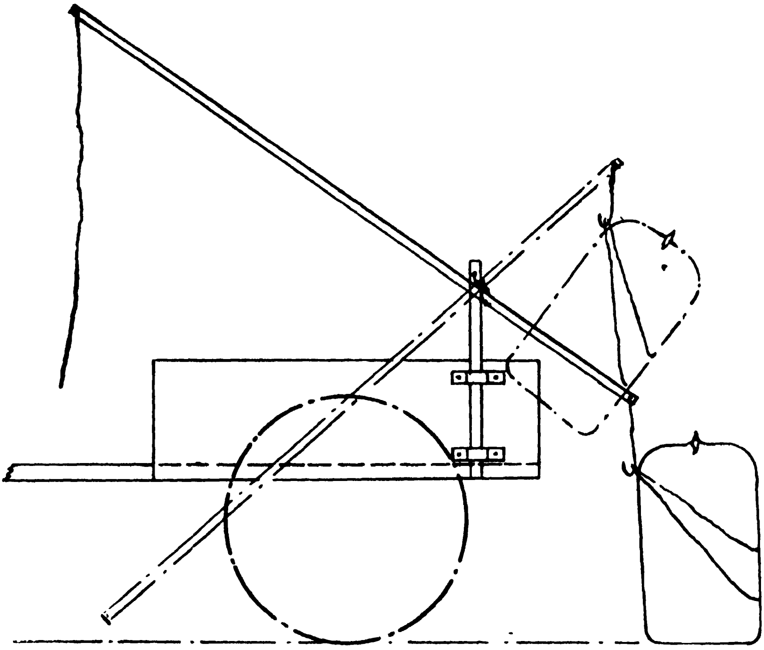
‡ Official analyst reports—"This sample contains carbonic acid equivalent to 21·5 per cent. of carbonate of lime and 6·18 per cent. of insoluble matter. The sample, therefore, consists of bonedust mixed with about 15 per cent. of shells and sand."

Thomas phosphate (H. & E. Alberts), imported by Messrs. Geo. Wills & Co.; two shipments showed on analysis to contain 17·25 per cent. and 18·7 per cent. of phosphoric acid respectively.

To Prevent Metals from Rusting.—Melt together three parts of lard to one part powdered resin. A very thin coating applied with a brush will keep stoves and grates from rusting—in fact will do for most metals. A little black lead may be mixed with the lard if desired.

A SIMPLE WAGGON-LOADER.

The following sketch shows roughly how to save some of the heavy lifting when loading grain or other produce :—



Two iron clamps are wanted on the rail and bedplate, as shown, into which a wooden standard 6ft. long can be affixed. At the top of the standard a long pole is slung by a piece of raw hide or chain. At the short end of the pole a hook is attached, and this takes hold of the loops of the sling which is placed around the bag. A line should also be attached to the short end for pulling it down. The leverage afforded by the longer end of the pole makes loading an easy job.

FARM HINTS FOR APRIL.

By the Editor.

Perhaps those who failed last month to sow an acre or two of the stubble lands, or even fallow, with mustard or rape are now sorry that the advice was not followed, seeing that good rains have fallen in many places, which would have started the seed and given a good stand of early feed. It is not too late to sow from two to three pounds of either or a mixture of both during this month, as the plants grow very quickly under favoring circumstances. After rain storms and strong winds the old, dry, natural herbage loses the greater part of its nutritive value, or it becomes embedded in the soil or blown away, and if there is no provision whatever made for feeding the live stock of the farm great losses must inevitably occur. For this reason, if not on humanitarian principles, a portion of the farm lands must be devoted to the growth of seasonable fodder for the farm animals.

Many farmers have commenced sowing their wheatfields, and not a few have neglected to pickle their seed. Should there be any bunt spores amongst the seed, and should the soil be sufficiently moist to start the wheat growing, it is almost certain that the crop will be "smutty." Where the soil is only slightly moist the wheat will not germinate, but the bunt spores will start to grow, and will die for want of a plant to live upon. When the grain afterwards germinates it will be free from its enemy, and will become a fertile plant. There is always a possibility of rain occurring at this time of year, and this will start both wheat and its parasitic "bunt" growing together; therefore it is never safé to sow grain that has not been pickled to kill the bunt spores.

Where ground frosts are severe it is hardly possible to establish lucern from seed sown at this time of the year, and the sowing must be deferred until September or October, so that the young plants may escape their influence. But in many localities it is quite safe to sow seed during this month, and the plants will gain such root strength during our wet season that great progress is made during spring and the warm weather following. Lucern will grow well even on slightly saline soils. The best soil for the plant is deep, light, rich alluvium, where water is to be found beneath at not more than 16ft. Plough deeply, work the soil down to a fine tilth, and as level as convenient. drill in seed ½in. deep, 10lbs. to an acre, or 16lbs. to 20lbs. broadcast. Roll lightly at once. Some people sow a nurse crop of barley or wheat at same time, but it is doubtful if this is beneficial.

Stubble lands after the mower or binder that are intended to remain for three or four months might be utilised by sowing a mixture of 2lbs. white mustard, 1lb. rape, and 25lbs. barley or rye on the surface, and scarifying or harrowing them in. Within five weeks there would be a good stand of green feed, upon which the live stock could be put. The soil would be mellowed and enriched by this treatment, and during August the field could be ploughed and laid up in fallow, or used in September or October for sowing with maize or one of the many varieties of sorghum.

There are many plants that can be grown for ensilage, and the greater the variety grown the more wholesome and palatable will it be for the stock. Peas, beans, vetches, mustard, rape, cereals of all kinds, could be sown together, using small quantities of seeds of each. If they can be sown so as to have all in flower at once all the better. Dirty land could be cleaned by growing an ensilage crop on it.

Manure should have been carried on to the fields before now; but get it out and spread and turned under as soon as possible. New manure could be carted out day by day and spread on fields intended for growing hay. If spread out it cannot ferment, and without fermentation there cannot be much loss of ammonia, because it has not been produced. But there is the danger of undigested seeds to be considered where a grain crop has to be grown, therefore fresh manure should only be spread upon land intended for pasture or for cropping for hay. Farmyard manure loses a large proportion of its fertilising value as well as much of its weight in the process of "making," but the heat and fermentation destroys the seeds of weeds in it.

Separate the boars from the sows until June next. Winter litters of pigs are not profitable in most instances.

In the further southern parts of the colony and in the cool hilly districts it is not usual to sow peas so early as in the portions where the climate is much warmer and less favored with rainfall. An average crop should give 30bush. to 40bush., with 25cwts. straw; but the soil should be fertilised with about 900lbs. of a mixture containing 8 per cent. available phosphoric acid, 11 per cent. potash, and 1¼ per cent. nitrogen. This last ingredient may not be necessary if the soil is rich. Calcareous loams and sandy gravelly soils best suit peas. Green peas of very early sorts pay well to grow, and as much as 150bush. per acre in pod is calculated as an average crop in Europe and America. Peas enrich and clean the soil. Two feet apart is enough for field peas. From 2bush. to 3bush. per acre of seed is required.

For pasture purposes all kinds of hardy grass seeds should be sown at once in the cooler hilly districts and South-East. Poas, fescues, rye grasses, cocksfoot, clovers, and trefoils are most in favor. A mixture is best when there is no intention to save seeds.

Solid-strawed wheats are favored by many growers on account of the weight and sweetness; but the bearded sorts are not liked by many because, they say, the beard collects in the mouths of horses and causes trouble. Professor Lowrie said he found no trouble of this sort when he used Medeah hay; but then he paid ordinary attention to his horses and removed any collection whenever necessary. He is strongly in favor of this variety for hay and grain, but finds it difficult to secure a change of seed. There are several varieties of solid-straw wheats, some of them beardless and others which drop their heads.

Plant out Jersey tree kail, kohlrabi (or sow seeds), thousand-headed kail, and cow cabbage on heavily-manured land, well tilled, and during growth keep the soil always cultivated. The kails and cabbage plants should be put in at least 4ft. apart.

There are some places where field crops of potatoes can be grown. Frost is the danger to be guarded against. Plant medium sized potates in rows 30in. by 12in. and 4in. deep. Every third plough furrow will give this distance.

Do not fail to provide shelter for all the farm stock. Apart from any humanitarian principles, it will not pay to omit to perform this work. Loss in condition is loss of profits that had already been made, and which must be remade, if possible, at the cost of the owner.

HEAVY MORTALITY AMONGST STOCK.

Mr. Inspector Williams reports heavy losses in cattle in the hundred of Young, in the South-Eastern District, which should be a warning to farmers, and show them the necessity of providing clean water for animals. In many places all over the colony the water supply is very bad. The following is the substance of his report:—

"I went out to the hundred of Young, and saw twenty-six cattle standing round two filthy waterholes, and sixteen carcasses lying about. Two bullocks were noticed to stagger forward and fall when they were driven. When down there was a shivering of the body and limbs. After a few minutes they gradually righted and got on their feet, but their gait was unsteady and their eyes inflamed, while their heads were carried high, and there was a visible stiffness of the neck and spine.

"I made a *post mortem* on the carcass of a beast that had died, but as *post-mortem* changes had occurred I did not consider it satisfactory, so had an affected steer killed, and had a good *post mortem*. The rumen and abomasum were normal, no trace of phosphorus or dead rabbits being visible. The omasum was inflamed, some of the leaves slightly thickened, and there was a peculiar brownish jelly-like substance rather tenaciously adhering to the mucous membrane. There was marked inflammation of the liver; a dark slimy substance was present in the intestines, and a dirty-brown jelly-like fluid in the abdominal cavity. There was liquid in the sac surrounding the heart, and a little liquid in the chest, the fluid having the peculiar brown tinge when very closely examined. One of the most interesting features of the *post mortem* was, however, the brain. On opening the cavity about 2½ozs. of the peculiar dark fluid flowed out. The brain was congested to a depth of from ½in. to ¾in., and changed from the normal white substance to a yellowish-brown tinge, while its surface was completely invested in a black pigment, with thickened branches through it. This black substance made a mark on a white surface like ink. There was fluid along the spinal canal having the same brown color as that on the brain and other cavities of the body. I collected good specimens in sterilised bottles, and had coverslip preparations ready for microscopic examinations four hours after the *post mortem*. The results of the examinations are interesting, instructive, and may open up quite a new field of knowledge in connection with brain troubles that have come under notice in many cases when no impaction of the omasum was present.

"In all the specimens the same brown cocci occur in dense masses, as if grown in a culture tube. The brain substance is particularly interesting, as showing the depth to which change had occurred in the affected areas through the invasion by the army of organisms.

"A few years ago, when carrying out some investigations with regard to sheep affected with a complaint which was to all appearances identical with that of which the cattle at the hundred of Young have died, I found the same micro-organisms in fluid from the spinal canal, the brain, and in the blood, &c.; also in the ticks that were found in the affected sheep. It is also the fourth occasion on which I have found the organism in affected cattle, and I feel the time has arrived when the matter should be brought under notice with a view to warning stockowners of the danger to stock by allowing them to drink filthy water which has been polluted by animal evacuations for years. Nothing could be more suitable for the growth of filth bacteria than dams, dug-out waterholes, and drying swamp-holes. The water decreases while the parasitic life increases, till that stage is arrived at in which countless millions of germs reach the stomach of the animal when it drinks, and sooner or later disease and death is the result."

AUSTRALIAN LEATHER.

In consequence of complaints made some months since, that the British War Office refused to use Australian leather for boots and other purposes, on the ground that it was inferior and inefficiently prepared, the Agent-General for South Australia was requested to obtain and forward samples of the leather used by the War Office, and to make inquiries on the matter.

The Hon. Minister of Agriculture has now received samples of the leather used for sole leather, together with the following communication from Mr. E. Burney Young (manager of the London Produce Depôt):—

"I have made extensive inquiries among the principal leather merchants and leather factors in London, and I find considerable divergence of opinion on the question as to whether the colonies can supply the quality required by the War Office. On the 1st instant I visited the establishment of Messrs. Saml. Barrow and Brothers, Limited, of Western-street, London, S.E. I was shown a large number of specimens of Victorian, South Australian, and New South Wales leather, together with English and foreign. It was pointed out to me that the chief faults which characterised importations from South Australia were—1. The pelt is usually very much damaged by hacking it when flaying. 2. The custom of branding on the rump detracts very greatly from the value, as that is the most valuable part of the hide. 3. Another criticism offered is that Australian leather has not sufficient substance for War Office standard. The superiority of English leather in this respect is said to be probably due to the higher feeding of animals, especially when young. 4. The tanning materials used in England for first-class leather are better and more expensive than those used in the colonies. The War Office use nothing but the very best leather, and Australian, at any rate that sent to England, is a long way below the standard, especially from the point of view of substance. Messrs. Bevington and Morris, on the other hand, think that the War Office is prejudiced in the matter, and they are of opinion that some of the Australian leather is suitable for War Office use. Messrs. T. J. and T. Powell, who are interested in the question, are emphatically of the same opinion. Messrs. A. Brooksbank & Sons, a very large leather firm, support Messrs. Samuel Barrow & Brother, Limited, affirming that Australian leather is unsuitable for War Office purposes, as it is too soft, and has not sufficient substance, especially for boots, and the branding spoils it for harness purposes. They think that the best leather is kept for local use and the inferior sent to England. The samples shown to me certainly lend color to Messrs. Brooksbank's remarks, as they were for the most part badly hacked, greatly disfigured by branding, and wanting in substance. However, as there appears to be so much difference of opinion on the subject, I judged that the best way to settle the question would be to send a sample of English leather that is used by the War Office for boots, by which the manufacturers would be able to judge for themselves if they can produce an equal quality, or nearly so. It would of course be useless to approach the War Office at the present juncture."

The samples of leather referred to have been placed on exhibition at the Century Exhibition, and have been inspected by a number of our principal tanners, who declare them to be badly grown and flayed, whilst the grain is extremely brittle, the fibre having been injured by drastic lining. They can easily understand that if such leather has been used for boots for the soldiers in South Africa and the Soudan that it has not given satisfaction, as with such short dry fibre it would "chip" readily and not be impervious to water. The Master Tanners' and Curriers' Association propose to deal officially with the respective merits of the imported and colonial products.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.
3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with:—
    1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
    2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.

3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. Batchelor, Minister of Agriculture.

DETERIORATION IN AUSTRALIAN BUTTER.

By G. S. Thomson, N.D.D., Dairy Instructor.

The question of alleged deterioration in our export butter is receiving serious consideration in dairy circles, and if the allegations are justified it is earnestly hoped that the matter will be fully investigated and the causes found. Our reputation as a butter export country is too valuable to be neglected, and were it to become stained it would afford an opportunity to our rivals to strengthen their positions and prejudice the reputation of Australia so admirably held in the world's greatest market. We are the second largest exporters of butter to England, and during the past year 366,944cwts. of butter were shipped from our shores. France follows us closely with 353,942cwts., and Holland, Canada, and Sweden have sent from 245,000cwts. to 284,000cwts. Denmark is far ahead of Australia, her shipment amounting to 1,430,052cwts. Compared with the preceding year it is reassuring to be told that Australia has gained an advantage over Denmark in the extent of the exports. Both France and Sweden have also fallen behind, but Holland appears to be holding her own. The South Australian increase for the past season has been 4,460cwts., and with a good rainfall we may expect to establish a record for the coming export year. But the aim must not be to ship quantity at the expense of quality, which is a matter too critical to be again overlooked. It may act as a warning by alluding to the prices of butter in the British market and the influence of low-grade qualities as a factor over the prime product. The average price for butter throughout the winter months in England is 1s. per pound, and this quality can be purchased wholesale from 91s. to 96s. per hundredweight. The choicest commands a little higher—from 97s. to 99s. per hundredweight.—and this is retailed at 1s. 2d. per pound, which gives a very high profit to the grocer. Again, there is the 10d. per pound butter, which is bought from 82s. to 84s. per hundredweight, leaving the merchant a profit of about 10 per cent. compared with 33 per cent. for the choicest. With large consignments of the second-grade butters and the uneven system of retailing, the high-class product is handicapped to the gain of the wholesale grocer. To prove the peculiarity of the market, returns from London show that prices have been paid for low-grade butter equal to that of the best quality—a problem difficult to account for.

Concerning the quality of our butter there is a universal opinion that large quantities undergo deterioration before shipment from our ports; but I am not prepared to say that deterioration is in excess when compared with the average of past years. Let us consider reasonable causes for a falling off in the quality of butter. For a new country to plunge too fast into theory without consulting practice and climatic conditions and soils would bode evil. Breeding and feeding of stock, cream ripening and churning, will be carried on according to the district where dairying is conducted. The travelling butter and cheese maker can give experience of the variability of districts and the obstacles to be faced when demonstrating to the learner the methods and changes to be adopted and considered to comply with his peculiar locality. The soil and climate of Australia is widely different from that of Denmark or Great Britain. We exceed those countries in drought and heat and rapid maturity of feed. These conditions are natural to Australia, and favor the manufacture of fine aromatic butter. The tendency of our climate is to rush plant life, but nature has endowed the wild herbage with a term of growth which makes its development slow and matured. Compared with the cultivated rank-growing green feed of milking stock we find in the latter a weak, a bodyless quality, poor in the constituents required for the formation of milk. In the former case there is that solidity which accompanies maturity, and favors that richness of milk conducive to the production of solid and aromatic butter. Experience tells us that the quality of butter is highest when feed is short and dry in the summer months. What would happen in districts with a good rainfall if milking stock were heavily fed on rank crops cut down in the growing stage? The quality of butter would fall, and it is my opinion that in parts of Australia where conditions favor the extensive cultivation of succulent food for milking cows the butter manufactured would lose some of its aromatic and keeping qualities, and more especially after a period of refrigeration. It is in the season of drought and scarcity, when the natural food is deficient in quantity, that cows require succulent plants to aid in the digestion of the solid and nutritious herbage, and to protect them against the attacks of stomach complaints.

Deterioration in butter is caused through the milk of newly-calved cows being creamed for butter-making. Consider the many thousands of stock which come into milk when green food is abundant in the winter and spring and summer months. The season of calving in the average district is so arranged that the majority of cows will calve within a limited period.

Again, the milk of cows advanced in lactation is used for butter-making, and one has only to taste those abnormal fluids to form an opinion of the quality of the butter manufactured. Milking cows when they are in season endanger the quality of the butter, and the extent of the unpleasant flavor in 1gall. of milk will, in some instances, lower the quality of the butter manufactured from 50galls.

Again, bad drinking water for cows has an injurious effect upon milk, just as certain foods bring about a taint in the milk supply.

The free and unrestricted addition of preservative compounds to milk, cream, and butter is becoming so deliberate that action is wanted. Boracic acid and formalin compounds are sold wholesale and retail. Chemists and grocers dispense these preservatives in abundance. In the summer months the milk suppliers of the town take great liberties in the way of extending the keeping quality of their milk, and in more than one instance I have found very strong reactions for formalin in samples submitted for examination. Milk vendors have no conception of the dangers associated with fancy-named and so-called harmless preserving salts; hence their abuse. The unscrupulous addition of preservatives to cream, and again to butter, must have an injurious influence upon the quality of the latter. Perfect natural ripening of cream is essential to good-keeping butter, but when fermentation is arrested with preservatives the butter manufactured naturally suffers, and this injury may become intensified after chilling It has been proven that the judicious application of preservatives to dairy products does extend the keeping quality.

I will now deal with what is supposed to be the chief cause of the alleged deterioration—the small separator. Injury to butter is done when owners of small separators manufacture butter from cream collected from five to seven days, and this butter with deterioration already begun is sent to Adelaide to be sold or shipped along with similarly-tainted products. Again, cream is forwarded to town from far northern and southern districts in 10-gallon cans once a week. Is it possible for such cream to arrive in a sound condition after being gathered for days, and in many cases driven distances and well shaken at a high temperature, and, lastly, unprotected and delayed in railway transit?

With the farmer's care, and help and attention from the railway authorities, much could be done to reduce the deterioration in our summer butter. Undoubtedly the small separator is a boon to many small farmers, as well as a dangerous weapon in the hands of others and in districts where its use is entirely misplaced.

Much of the butter exported throughout the past season has not been of a high quality, but quite the reverse; still, the factories have not fallen below their usual good standard of the past. The consignments of pastry butter were invariably packed up in Adelaide, and not, as some people would seem to believe, at our country factories. Heavy traders in this class of mixed butter, partly made in town from inferior cream, and partly bought up from small buttermakers in bulk and in pounds and the refuse or unsaleable quantities, all branded with the exporters' varied brands, have done much to wreck the prices of the sound and reliable butter.

The butter industry of South Australia will always be fighting difficulties until we have centralisation of factories. In each dairying district the largest factory with an extension added would meet with the supply of milk and cream, and the minor factories would take the place of creameries, or, in other words, feeders. Pasteurisation could then be adopted, and the system of buttermaking put on the same footing as that of Denmark.

POTATOES.—The following points in connection with potato cultivation will be of interest to planters. Careful experiment has proved that, weight for weight, cut setts give just as good returns as whole setts. An increase in the size of the sett up to 4ozs. or 5ozs. results generally in increased returns, but whether such increase is profitable will depend on extent of increase and cost of setts. In poorer soils larger setts should be used than in good soil. Setts 1½oz. to 2ozs in weight will on the average be most profitable. For early potatoes whole setts up to 4ozs. in weight may be best. Distance apart will depend upon size of setts and climatic condition. Smaller setts can be planted closer together than large setts, and the drier the locality the further apart should the rows be. Rows should be from 2ft. to 3ft. apart, setts 9in. to 15in. Setts should be even in size to secure regular returns. It must be remembered that the crop is largely dependent upon the number of stalks to the sett, and that the number of stalks is governed by the size of the sett and not by the number of eyes. Each eye is in fact a group of embryo buds, and with small setts only one or two develop from each eye, whereas larger setts even with fewer eyes will produce as many stalks. There is no difference whatever in returns from setts taken from different parts of the tubers. Some growers claim that the "seed end" produces fewer and smaller potatoes than the stem end, while others assert just the opposite. Four inches on the average is the best depth to plant. If too shallow the tubers will be sun-scalded unless hilled. A change of seed is important. Not more than two crops should be grown without a change. Where leaf blight or early blight—a fungus disease causing greyish-brown spots on the leaves—is known to occur the potatoes must be sprayed with Bordeaux mixture when about 6in. high, to be repeated at intervals of a fortnight. Once the plants are attacked spraying does not appear to have much effect, as the disease is very rapid in its action. Prevention, not cure, is the point to be aimed at.

AGRICULTURAL BUREAU CONFERENCES.

MURRAY RIVER BRANCHES.

A Conference of Murray River Branches was held at Mannum on February 28, 1900. The following members were present:—Mannum Branch: J. G. Preiss, E. Scheutze, R. Heinrich, W. Kowald, J. A. Schultze, A. Faehrmann, G. Lenger, B. Baseby, H. Wilhelm, J. W. Walker, J. Nickels, R. P. Scott, J. L. Scott, and H. Brown. Bowhill: H. H. Plummer, W. G. Plummer, J. McGlashan, E. P. Weyland, and C. Drogemuller. Murray Bridge: W. Lehmann and B. Jaensch. Forster: J. Sears, J. Retallack, and F. Towill. Central Bureau: The General Secretary; also G. S. Thomson (Dairy Instructor), and George Quinn (Horticultural Instructor). There were also about 120 visitors during the sessions.

Exhibits.

By Mr. E. Scheutze—Grapes and tomatoes. By Mr. J. Nickels—Grapes. Samples of pears and melons were also shown. These fruits were all very fine.

Introductory.

Mr. J. G. Preiss took the chair, and in welcoming the members and visitors to the first Conference of River Branches expressed the hope that all would profit from the exchange of experiences and practices, and from the discussions that would take place that day. He would have been better pleased to have seen more of the River Branches represented, but they were so far apart, facility for travelling was limited, and times had been so bad that distant Branches could not well be represented on this occasion. He referred to the part science was taking in agronomical pursuits of the present day, and made special reference to the large use that was now being made of artificial fertilisers.

The Standard Sample of Wheat.

The General Secretary, by request, read Professor Lowrie's remarks at Gladstone and Quorn upon the subject of the so-called "standard sample of South Australian wheat for season 1899-1900," and, after a good deal of discussion, the following resolutions were almost unanimously adopted:—

That this conference of farmers think the time has arrived for an inquiry whether it is practicable to fix a constant standard for wheat, to be graded as Nos. 1 and 2.

That it be a request to the Central Bureau to move for a representative meeting of farmers, millers, and wheatbuyers, to decide whether the proposed change should be made and to fix the constant standard if the proposition is approved.

How to Grow Good Crops in Dry Districts.

Mr. W. Lehmann, Murray Bridge, read the following paper:—

To grow good crops of wheat in districts limited to a rainfall of about 12in. to 14in. has become somewhat difficult under the old style of cultivation, more so on account of the soil having become impoverished and overrun with weeds through continuous cropping and grazing without restoring anything to the soil. But, without a doubt, it is possible to grow heavy crops with the aid of artificial manures. Under the most improved system of cultivation it has been proven a success in other parts of the world; for instance, in parts of America where the rainfall only averages about 12in., by fallowing up to a depth of 12in., thereby conserving more moisture than by ploughing only from 4in. to 6in. You will have observed that deep sandy soils will grow the finest crops with artificial manures, because sandy soil will absorb moisture readily, the rains penetrating well into the subsoil, and on account of its loose nature and fineness it is well adapted to retain moisture, the roots of the wheat-plant easily penetrating the subsoil after moisture. Although the same amount of rain falls on the different classes of soil in the same paddock, still the sandy parts grow by far the finest wheat, notwithstanding the sandy soil being the poorest in the paddock. This proves conclusively that sufficient rain has fallen to grow a good crop, but it also proves that other than sandy soils require different treatment to obtain satisfactory results. Then why not try to prepare all classes of soils to closely resemble sandy soils, which may be done by fallowing about 5in. deep and subsoiling another 7in. To fallow the land early is preferable, as this would cause all rubbish, &c., that is ploughed under to rot, such as straw, old grass, manure, or growing weeds. This all becomes available for plant food at seeding time. Early fallowing will cause a greater proportion of weeds to germinate, which then can be destroyed by the scarifier or harrows, but the principal object at all times should be to retain as much moisture as possible in the fallow by scarifying or harrowing after rains. Any soil prepared in this manner is in fairly good order to receive the seed, even if no rains fall at seeding time, the soil being in first-class order to absorb all early rains that may fall. With a certain amount of moisture in the subsoil, and the rains at seeding time, the wheat plant would not receive that check that it otherwise would on land depending altogether on the rainfall at seeding time or later. But still there are soils that are not altogether a success when prepared in this manner and drilled in with artificial manures, such as clayey, heavy loam, or ashy land, that will neither absorb nor retain moisture as readily as sandy soils. It is observable that when artificial manures are drilled on other than sandy soil the wheat plant receives a check when dry weather continues too long This is partly due to the manure being drilled into the soil in a thin streak near the surface, which would cause the roots of the wheat plant to concentrate their energies around this layer of manure and absorb all the moisture around it before the next rain falls. The roots then would have to penetrate the tough subsoil after moisture, perhaps without obtaining any benefit of the manure at the time. Now I suggest that experiments be made to overcome those partial failures ; for instance, to fallow and subsoil as before mentioned, but to drill in with the subsoil a certain amount of non-heating or slow-acting manure, such as Thomas phosphate, guano, guano super., or bonedust. Those manures would become available to the wheat plant when coming in head and filling grain ; the wheat plant mainly relying on the subsoil for moisture in its later stage, with the manure drilled in at a depth of 2in. to 4in. With a low rainfall the manure has not been sufficiently drained into the subsoil to give the wheat plant a chance to draw on the manure as well as moisture to form and fill out the grain to satisfaction, as I have noticed the soil to be quite dry to a depth of 1ft. to 15in. at that time. One serious objection to drilling in the necessary manure to grow a good crop with the seed at a depth of 2in. to 4in is that, all the manure being close around the seed, it starts a too strong vigorous growth that it cannot later on maintain ; but should the seed be drilled in with a certain amount of manure, sufficient to start the crop well, and a certain amount fallowed into subsoil, this would then give the plant the required moisture and manure combined at a time the plant required it. To sum up the whole in a few words, artificial manures must be used to obtain a good crop on impoverished soil, and as we cannot increase the amount of rainfall in semi-dry districts, we must try to conserve sufficient moisture in the subsoil. In my opinion, the principal and payable product that can be produced in semi-dry districts is wheat, and wheat we will have to grow, including a little wool. In using artificial manures on fallow land with an early variety of wheat, the result will be a quicker return, a more upright and stronger straw that will withstand storms better. You will get cleaner wheat crops with the use of manures, as the wheat will start strong and vigorous, and choke down wild oats. One paddock that I have had cropped and grazed since 1882 has been overrun with wild oats. and appeared to be so exhausted that it would not grow wheat, grass, nor a decent crop of wild oats at last ; but when fallowed and treated to a liberal dressing of artificial manure, it produced a finer crop of hay than it had when new land. Then being left out for grazing it produced a splendid crop of early feed, the better quality grasses predominating, this being fed down for fattening lambs up to the end of August, when the residue of feed was fallowed under. Having this land under crop this last season for hay, with a dressing of 1cwt. of English superphosphate, it produced a crop in excess of any previous grown on it.

In answer to a suggestion that an invention is required for ploughing and subsoiling at one operation, the General Secretary stated that it is usual to use a double-furrow plough with the mouldboard removed from the front plough and setting it deeper than the other. He had at one time induced Mr. J. W. Stott, of Hamley Bridge, to affix "grubbers" at rear of each sole plate, and these would break up the hard pan to a depth of 2in. or 3in., but the farmers at that time did not appreciate the improvement.

The Chairman mentioned that some land would not bear fallowing. He noticed last year, when digging out rabbit burrows 2ft. 6in., that there were wheat roots still going down. He believed in subsoiling hard soils.

Mr. **Faehrmann** said limestone country could not be subsoiled. The wheat held splendidly, however. He ploughed 12in. deep. It grew well in the winter, but went off to nothing. The following year, however, it produced his best crop.

Mr. **Quinn** said from his gardening experiences he could say that the digging in of weeds and vegetable matter had a most beneficial effect.

Messrs. **Baseby**, **Lenger**, and **Lehmann** agreed that the land is benefited by ploughing stubbles under, provided time is allowed for the straw to decay.

Mr. W. G. **Plummer** said that he had found that by burning the stubble mallee sticks were better got rid of. It would be better to burn stubble, and fallow it up by planting some green stuff.

Mr. **Jaensch** said he had used from 70lbs. to 75lbs. English superphosphate, and had had very satisfactory results. This super. was the most suitable for the Murray sandy flats. Other kinds he had tried had not been so successful.

Mr. **Molineux** stated that throughout the colony in many parts the results had been double. One reason why the English superphosphate had answered so well in dry districts was that it acted more quickly than Thomas phosphate, bonedust, colonial guanos, and other slowly soluble phosphatic fertilisers.

Mr. **Faehrmann** had not seen so very much difference on his land by the use of English superphosphates, but he supplied some to a neighbor, and a change very much for the better was apparent. The Thomas phosphate had answered well after a time.

Mr. E. P. **Weyland** said he ploughed, sowed, and harrowed Thomas phosphate in, but it was too slow.

Mr. G. **Lenger** had tried the English superphosphate, Thomas phosphate, cave phosphate, and island guano. In the first year guano was a failure, but the English superphosphate answered best. In the following year, however, he could see little difference between the effects of the phosphates and the island guano.

Mr. **Lehmann**, in reply, said that for the first few seasons he had broadcasted colonial superphosphates, then English super., followed by Thomas phosphate. The two last-mentioned proved the best. He then drilled English super. at the rate of 1cwt. to the acre, which produced a first-class crop. Last year he had drilled the same. A neighbor put in 50lbs. to the acre, and was congratulating himself on the prospect of having the best crop in the district. It looked much better than his, but when it came to the reaping his (the speaker's) crop realised 12bush. and his neighbor's 8bush. There was not sufficient manure in his neighbor's land to develop the crop fully. He did not think it necessary to fallow sandy land, and the more stubble left in it the better. How were they going to retain moisture in heavy lands without subsoiling? The only thing to do with limestone soil was to fallow it. It was advisable to plough straw under in wet districts, but only when it had plenty of time to rot. He did not favor burning off timber, as it burnt the substance out of the ground, and, though at first the growth was apparently vigorous, as time went on the strength weakened off to nothing.

District Co-operation.

Mr. H. H. **Plummer** read a paper on "District Co-operation," to work in conjunction or affiliation with the South Australian Farmers' Union. He advised that the colony be divided into electorate divisions, each division electing delegates, a district to constitute one or more hundreds according to size, and each district to have voting power of its own, subject to consent of delegates. The union should take up industries in districts with the consent of shareholders. Co-operation should gain the advantages for the shareholders of commercial conditions.

Mr. W. **Lehmann** inquired why they could buy cheaper from merchants than from the Farmers' Union, a point which was disputed, whilst he was annoyed that the Murray Bridge mill was not purchased by the Farmers' Union.

Other speakers declared that the purchase of mills meant running in opposition to millers, who were their best customers.

Mr. **Brown** said that the Farmers' Union had started the year with £11,000 received from farmers; yet £23,000 was expended in cornsacks and manure. That additional money had been provided by the directors, who had guaranteed overdraft. The turnover had been £171,000, which spoke volumes for the energy displayed by the manager and directors.

The discussion was carried on to some length, but no conclusion was arrived at.

The meeting adjourned for tea and resumed at 7·30 in the evening. On resuming, the chairman called upon Mr. G. S. Thomson, Government Dairy Instructor, who addressed the meeting on—

Dairying.

At the beginning of the address Mr. Thomson spoke at some length upon the attractions of dairy-farming compared with other agricultural pursuits and with occupations in the city. He explained the advantages of science to the dairyman, and took as a striking illustration what Denmark has achieved as a rival against Australia in the butter market of the world. In that country the average farmer was not a theorist, for such men were dangerous; but the Danes appreciated and put into operation what the scientist proved to be to the farmer's advantage. "Practice with science" ought to be the aim of all dairymen, and if one compared for a moment the advance dairying had taken throughout the past twenty years the value of that grand motto would be evident to all. Science alone had revealed the great dangers our milk and produce were exposed to by the ravages of microbe life accompanying dirt, and unless the milker and those working in the dairy have this in mind failures would certainly follow. If there exists a secret to successful dairying it is to be found in the word "cleanliness." The lecturer explained how souring of milk was brought about by the action of germs, and in the operation of milking he emphasised the strictest attention. Turning back, he asked himself the question as to the requirements of a farmer about to settle on the land, and in reply said that some capital was necessary, favorable land, and the farmer himself must be a man of energy and perseverance. Many unsuccessful farmers owed their failures to want of energy and want of loyalty to that particular line of agriculture; they were inclined to go as they thought with the tide of fortune by practising branches of agriculture unsuited to their farms. Settled on the land, the farmer would first consider the foundation of his success, and that was the quality of his milking herd. He would purchase a sire belonging to a thorough milking strain and mate him with cows of equal dairying attainments; his eye would be always vigilant, and his attention centred on the herd; poor animals he would not keep; only from the best he would rear his heifer calves. The food was an important consideration, and one generally overlooked. Thousands of cows have died throughout the past dry years, but the lives of many could have been saved had a little green food been grown on the farm. Living solely on dry herbage brought on impaction, but with an allowance of sorghum, lucern, silage, or anything green, such a disease is warded off and the supply of milk increased. Influences affecting the quantity and quality of cows' milk were explained, and amongst those worthy of attention was kind treatment during milking and change of pasture. Separation of milk was gone through, the old and new systems being explained. With the separator it was important to pass warm water through the machine before the entrance of the milk;

otherwise a loss in butter fat would be sustained. Acid milk when heated also caused a loss of cream, and milk at a low temperature did likewise. Cream ripening and churning were gone through Special attention was drawn to the common practice of dairymen skimming the milk of newly-calved cows; as long as this continued good butter and cheese would not be made. Preservatives were condemned on the ground of their interference with the ripening of the cream, which was productive of inferior butter. Danger to health was also caused, as a preservative in the cream and a preservative in the butter would bring the percentage up to a too high standard.

The treatment of butter at the Port Adelaide depôt was explained. Every consignment was examined and graded according to quality. If the butter was very inferior it was stamped "Pastry." By such a course the manufacturer of good butter was protected, and the name of the colony also. The low prices obtained for our butter in the London market was caused by the inequality of our shipments, large quantities of the butter being rich in buttermilk.

Social Gathering.

There was a very short discussion after Mr. Thomson's address, because the ladies of Mannum had arranged to give the members and visitors a social welcome, accompanied with light refreshments, light musical selections and recitations, finishing up with the "light fantastic toe," all of which were thoroughly enjoyed by about 150 guests.

Selling Bags as Wheat.

On the following morning Mr. A. Dohnt, of Mannum, read the following :—

The farmers all over the colony are not satisfied with the present arrangements, and my opinion is that we have a grievance. We have been buying our bags at 7d. and getting 1½d. for them. The wheatbuyers promised 1d more, buying wheat as gross weight. Comparing the prices here and at Port Adelaide of last year and this, we are not getting this. Last year wheat sold on the bank at Bowhill realised 5d. under Port price. The wheat was sold and the bags paid for, with the exception of the union, who were buying bags as wheat; the union's price under Port rate was 4d. This year we have only been getting 5d under Port price. By this we see that we are not receiving the 1d. bushel more. If it must be that somebody has to lose by the bag transaction, why should the farmer have to bear the brunt of it all? Why is it that a system cannot be initiated where the buyer will share the loss with the farmer? Then again, the buyers get more for the bags when put on the English market, owing to the higher price there. Under the present system if wheat is 5s. per bushel we would get 1d. per pound for our bag; if it is 2s. 6d. we get ½d. per pound. Why should the fluctuation of wheat determine the selling value of a bag filled with wheat? If the value of the bag is 7d. to a seller, what has occurred to make the value go down when full of wheat? Even supposing it were true that we were receiving 1d. more per bushel we would still not get what we have paid for our bags. Perhaps the only method, if the merchants do not fall in to agree to a businesslike system, it might be well to fall in line for mutual action as they have done.

After a lengthy discussion, during which the speakers were in opposition to the writer of the paper, and in which Mr. Brown said that the Farmers' Union accepted all the credit due to them, but no more. The bags were sold to farmers at the price paid by the Farmers' Union for them with the actual cost of transit added. He contradicted the assertion that the union price on the bank at Bowhill last year was 4d. under Port Adelaide price. Mr. W. Lehmann moved—"That this meeting is in favor of the system of selling bags as wheat." Seconded by Mr. J. A. Schulze. An amendment—"That the old system be reverted to by selling wheat net and bags to be paid for"—was supported only by the mover and seconder. Mr. Lehmann's proposition was carried.

Hints on Fruit Tree Cultivation.

Mr. Geo. Quinn, Government Horticultural Instructor, addressed the meeting on this subject to the following effect :—He referred especially to the Mannum district, where, on the calcareous soils of the high-lying lands, great difficulties had to be overcome through the heat and absence of sufficient rainfall; whilst on the flats of the river bed the fruitgrowers could easily irrigate their orchards, but in some cases, if not in every case, they had to deal with magnesia, soda, and other alkaline substances in the soil. Anyone proposing to enter upon fruit cultivation would have first to decide upon whether it is for home use or for marketing. If for home use, it would be advantageous to plant many varieties in order to maintain a continuous supply for the table, and quantity and appearance should be subordinated by quality generally, but partly by keeping qualities in the later varieties. The grower would select early, medium, and late sorts, and not too many of each. The man who grows for market purposes must study the taste of the general public, and the prices that can be realised. The earliest fruits pay best, and special attention should be devoted to these. The mid-season varieties of fruit are not as profitable to grow as the early and late sorts, because the market gets filled with such, even to the extreme of a glut sometimes, and prices hardly pay for the cost of production. Late varieties of good keeping character and fair quality will pay to grow. In regard to planting of fruit trees the preparation of the soil is most important for if this is not done there must be serious loss. There had been enormous losses in the past through neglect of this particular. In dry localities the principle adopted by nature should be followed. The best trees grow in localities where the roots can penetrate deeply into the subsoil. In this dry country plants require plenty of space in which the roots can ramify in search of moisture and food. In Europe it is the practice of many gardeners to prune the roots to prevent undue luxuriance in the wood growth; but it is not expedient in the greater part of this colony to follow that practice, but rather to encourage the fullest extension of the roots. On the river here in many places there is alkali of one sort or another in the subsoil, and it is necessary to learn what is the nature of the land before preparing it for the trees It often consists of a rich sandy alluvium resting upon a tenacious or impervious clay, which retains too much stagnant water, and the roots suffer; subsoiling in such cases is absolutely necessary to permit of the excess being carried away below the impervious crust and taking with it the alkaline matters which otherwise would collect and ultimately kill the trees. Land should be prepared for planting a few months previously, so that it may become aerated and sweetened. If the clay subsoil is not broken through a hard pan or crust forms, alkali collects and increases on the surface of the crust, and the heat draws it later on to the surface soil, and makes it unfit for the trees to live in. At Mr. George Chaffey's place at Renmark they broke up the tough subsoil with dynamite, and every second year they run a subsoil plough between the rows of trees, which prevents the formation of hardpan and accumulation of alkali. Where there is a deep friable soil the trees root more deeply, and thus are enabled to withstand droughts. From 18in. to 20in., if possible, is desirable for the trenching, leaving the subsoil well broken beneath, and the original top soil should still be on the surface. In districts of limited rainfall apricot, peach, nectarine, and other stone fruits could be raised from stones or pitts planted in the places where the trees are to permanently grow, as the taproot is not then injured by removal from the nursery, and the roots naturally run down deeply if the surface is maintained in a loose condition; and the trees will also escape attack by termites or white ants. If trees are purchased they should be young, sturdy, and clean in the bark—not old stock which has become stunted in the nursery. Young trees possess a better root system. If carried long distances the fibrous roots are likely to be killed by the heat and dryness. In such cases clean out all dry dead roots and shorten back the rest to about 1ft. Plant with the roots in a slightly sloping direction downward. Grow small short trees in preference to tall ones. If "formed" in the nursery they may need only a little shortening in of the branches; but a straight single stem is preferable, as it will soon overtake the other. If single stem trees have been secured cut down to 20in. length of stem, and then the buds will break below and the limbs can be developed in the proper positions during the next two or three seasons. For three years the growth should be cut back rather severely to produce a strong stem and sturdy limbs, which will resist wind storms and bear up heavy crops of fruit. Windbreaks are very necessary—not a single row, but two or three rows on the sides next the prevailing winds. The space occupied by these trees would not be wasted, and the loss in the vicinity of the windbreak would be compensated by the extra health and productiveness of the lesser number of protected trees. When irrigating it is desirable to make deep circular furrows around each tree, if only a small number, and when the soil has become mellowed, or when the water has soaked in well and the surface workable. the trenches should be broken up before the soil should be returned to the furrows. Where there are a number of large citrus trees it will be necessary to irrigate by channels or deep furrows between the rows. By this method the water is stored in the subsoil and is gradually brought to the surface under the influence of the sun's heat and capillary attraction. Excessive evaporation is prevented by keeping the surface loosened up, and thus suspending temporarily the capillarity of the soil. If possible, on the higher lands which are not irrigable, let in as much surface water as possible by means of drains from the adjacent catchment area. If the surface is kept loose air can penetrate and the roots will run down deeply and thrive, and when the land has been well soaked in August the trees will do well through summer with a very small supply of water. When the roots are deeply down in the soil the plough can be used to turn the soil up roughly during winter, so that the water can sink in without drowning the roots. Later on break down the lumps and maintain a friable condition of the surface. To grow fruit of good quality, careful systematic pruning must be done, and each grower should study the growth and conditions which govern the development of his trees when carrying out this important operation. Thinning off surplus fruits, more particularly from the peach and apricot trees, is a much-neglected precaution in most gardens. Plants, like animals, will, in spite of every care, become diseased or attacked by pests In a climate like this, which is so suitable to the wholesale propagation of certain pests, prompt action should be taken whenever anything injurious is detected upon the trees. Owing to the organisation of the Agricultural Bureau growers now had only themselves to blame if they failed to know what particular pests were damaging their fruits and the best known methods of prevention. Apart from remedial treatments, the speaker advised them to maintain a vigorous state of health among their fruit trees by adopting good systems of tillage, fertilising, and general care, and then doubtless they will be in a better condition to withstand attacks, though immunity cannot be assured thereby.

Next Conference.

It was decided to hold the Conference annually, and that the next one shall be holden at Mannum about the same time next year.

Conclusion.

The **General Secretary** moved that a comprehensive vote of thanks is due and is hereby accorded to all who have contributed papers, to all who have attended and helped in any way to the success of this Conference, and to the ladies who arranged and carried out the social on the previous evening. Motion carried by acclamation, and the meeting closed.

SOUTH-EASTERN BRANCHES.

The seventh annual Conference of South-Eastern Branches of the Agricultural Bureau was held at Lucindale on March 17th, 1900. Present:—For *Lucindale*—E. E. Feuerheerdt, E. E. Dutton, E. Hall, W. Dow, G. Humphris, L. McInnes, H. Langberg, A. Dow, B. Feuerheerdt, J. Bourne, G. C. Newman, A. Carmichael, and A. Matheson; *Millicent*—R. Campbell and H. A. Stewart; *Naracoorte*—S. Schinckel, H. Smith, Job Wynes, A. Johnstone, G. Nosworthy, A. Greenham, D. McInnes, and G. Wardle; *Tatiara*—T. Stanton. Messrs. A. Molineux, (Gen. Secretary), G. Quinn (Horticultural Instructor), G. Thomson (Government Dairy Instructor), Professor Lowrie (Roseworthy College), and the Hon. A. W. Sandford, M.L.C., of the Central Bureau, were also present. There were no delegates from the Mount Gambier or Penola Branches, owing to failure to secure a train for that day.

Exhibits.

The following is a list of the exhihits and the names of the exhibitors:—

Lucindale.—E. E. Feuerheerdt (Crower)—Eight varieties of potatoes, six of which were introduced by Mr. Krichauff, and distributed for experimental purposes, viz., Wolhtmann, Ehlers, Eyth, Thiel, Professor Maercker, and Gratia; the others are Red Skin and Adams' Prolific; two varieties of marrows, two varieties of mangolds, Bokhara clover, lucern, Johnson grass, Cockshin grass, Jersey tree kale, thousand-headed kale, Paspalum dilatatum (fodder grass), lovegrass, sheaf of hay, apples, pears, plums, tomatoes (three varieties), cucumbers (two varieties), sweet melons, French beans (two varieties), onions (two varieties), eschallots, garlic, Fourcroya longaeva, and sisal hemp. G. C. Newman - seventeen varieties of apples, three varieties of peaches, three varieties of pears, two varieties of grapes, almonds, and figs. A. Matheson—four varieties of apples, three varieties of pears, nine varieties of grapes, onions and cabbages. E. E. Dutton -- two melons, figs, and almonds. A. Dow—apples, grapes, and sorghum. J. Prider—bunch of grapes (very large). L. McInnes—six varieties of apples and figs. T. B. Johnston—six varieties of apples, two of pears, one of quinces, two of figs, one of grapes, and one of damsons. E. Hall—three varieties of grapes, one of peaches, three of pears, one of quinces, four of apples, one of figs, almonds, and walnuts. W. Dow—pie melon, collecton of dried fruits, four varieties of apples. G. D. Nosworthy—nine varieties of apples. H. Langberg—water melon, pumpkin, button pumpkin, pie melon, bundle of lucern, six varieties of wheat, oats, barley, Johnson grass, field peas, potatoes, almonds, six varieties of grapes, eight varieties of apples, five varieties of pears, plums, figs, Mexican fibre plant. Mrs. Copping—eight varieties of jellies, twelve varieties of jams, seven varieties of preserved fruits, twelve of apples, four of pears, quinces, figs, and grapes. There was on exhibition outside a well built buggy, nearly the whole of which was constructed and built by Mr. A. Dow. The only portions of the trap that were not the handiwork of the owner was part of the ironwork and the wheels. The body, pole, and shafts were made from sheaoak wood. A set of harness, which was also made by Mr. Dow, with the exception of the collar and saddle, was shown.

Millicent.—R. Campbell—twenty varieties of potatoes, large Russian sunflower, lucern, Paspalum dilatatum.

Mount Gambier.—Forty-three varieties of apples.

Tatiara.—F. Smith—three varieties of apples, and two of grapes.

Naracoorte.—H. Smith—thirty-five named varieties of apples, six unnamed varieties, quinces, four named varieties of pears, two unnamed varieties, almonds. G. Greenham—White Japanese cucumber.

MORNING SESSION.

Preliminary.

Mr. E. E. FEUERHEERDT presided, and after a short preliminary speech, called upon the General Secretary to open the proceedings.

MR. MOLINEUX was glad to see so many delegates present. From the limited number of applications he had received from members of Branches for railway certificates, he had feared the Conference was going to be a failure. It was a very fair average conference of members, and the exhibits were far in excess of anything he had seen at four previous conferences of the Bureau which he had recently attended. He was surprised to see the quantity and quality of good stuff. The South-East was undoubtedly suitable for the production of apples, pears, and dairy produce. The Conference was called for mutual instruction, and not for florid speeches and fine talk. They had held many meetings of this kind, and they were all productive of good. He had gone out speaking in favor of co-operative dairying, and had got the Bureau to take the matter up. Within fifteen months after the Bureau had taken the thing up they had thirty-two butter factories in South Australia. That led to the establishment of the State Produce Export Depôt, and it was mainly through the efforts of Mr. Sandford that they had got the butter bonus. The Produce Depôt was one of the best things they had got in South Australia. He believed in a system of co-operation, and believed they could not do better than co-operate Had the co-operative system been introduced at the Penola Fruit Colony they would have been far more successful. As a result of Central Bureau advocacy of the planting of certain kinds of vines over 4.000 acres had been planted with them within a short radius of Clare; and as a result of the work of the Bureau in advocating the spraying of fruit trees affected with diseases, £8,000 to £10,000 per annum had been saved to the Barossa district by fruitgrowers adopting this remedy—that was the lowest estimate put on it. They had seen the wonderful results obtained by the application of fertilisers to the land. Before the Branches of the Bureau took the matter up it had been strongly advocated, but no one paid attention to it; since the Bureau had advocated fertilisers tons of manure had been used, and in most cases the crops had been doubled. He thought these few items showed that the Bureau's existence was justified by the results it had achieved. He wished it to be understood that these conferences were not organised on the same principle as the Congress in Adelaide. At the Congress they could only expect a few delegates from each Branch to attend, but at the conferences they wanted as many members to attend as possible. The Bureau had a membership of 1,600. The idea of the conferences was to discuss matters of general utility, and each district should bring matters before its conference more particularly affecting the district in which the conference is held, such, for instance, as co-operation in fruit growing. If these matters were brought forward he thought the conferences would be more successful. They should not merely depend on papers either. He noted that this conference had depended largely upon the specialists connected with the Department of Agriculture for their programme; that should not have been so.

Chairman's Address.

The CHAIRMAN said:—It is almost needless to say that I deem it a great privilege and honor to preside at this Conference. On behalf of the Lucindale Branch it affords me great pleasure to extend to you all a most hearty welcome. Allow me to express my pleasure at seeing so many earnest, intelligent, and practical men present from the Central Bureau and South-Eastern Branches. Of course, I regret that the number is not greater, but taking into consideration the difficulties in reaching this spot the representative gathering present is further proof that members consider difficulties are created to be overcome. Our motive in meeting to-day is that all are unitedly anxious to do something, however little it may be, that may lead to better results from our work, and the presence amongst us of such gentlemen as Professor Lowrie, Mr. Molineux, Mr. Quinn, and Mr. Thomson, is a surety of success. We should like to have had Mr. Jeffrey, but he was unable to be present. We are to be favored with addresses from practical men on subjects of general interest, from which I feel sure all will gain a lot of good. The exhibition of produce, &c., gives additional interest to this Congress. It gives us an opportunity to compare the advantages which parts of districts have over others for the growth of particular varieties of cereals, fruits, &c. It also enables persons to identify the varieties, and is likely to lead to a uniform nomenclature, more especially in fruits. You will notice on the agenda paper that the next part of the proceedings is entitled "Conversational and Introductory." The idea of this is to allow a short interval for general introduction between members It has been remarked that at most Bureau Conferences members rarely get to know one another, and, therefore, one of the aims of these Conferences is not attained, and it was thought that if a short time were allowed to further this end it would materially benefit all.

Stock and Crops for the South-East.

Professor W. Lowrie, M.A., B Sc., Principal of Roseworthy Agricultural College (in the absence of Mr. G. Jeffrey, who was to have addressed the Conference on "Wool-classing,") said he was very willing to fill up the blank caused by the absence of Mr. Jeffrey, but Mr. Jeffrey's remarks would have been of more pregnant interest to the people of the district than his would be. They who were styled experts in the Department felt at a disadvantage in coming into a district without any knowledge of it, and in the face of that had to speak with more or less hesitation. He would be, therefore, satisfied if the suggestions he threw out would lead to discussion that would benefit the industry. The Professor then spoke on the advantages to be derived by farmers and stockowners in this district in putting in forage crops. The average soil conditions of the South-East, he said, were not up to the quality of the best growing wheat lands in South Australia, but the district was favored with a good rainfall, which made up a good deal of the deficiency in the soil conditions and adapted it to the growth of forage crops. The crops that seemed to him would grow best in the district were mangolds, kale, rape, rye, vetches, and potatoes. If these crops were properly cultivated and managed they would work in, both for the sheepfarmer and the dairyman To make a success of these crops, deeper cultivation would have to be adopted and heavier dressings of fertilisers given. By such cultivation he believed in many areas in the South-East where the crops could be grown, that a man could top up his wethers for the Adelaide market and get as much as 18s. and 22s. for them. He was of opinion that it would pay well to have a block of mangolds or kale and feed on it. They need not go to an extreme matter of cultivation with these crops, and they could adopt cheaper methods of sowing. Mangolds could be sown from ½lb. to ¾lb. to the acre, and rape from 1lb. to 2lbs. to the acre would pay. Mangolds was the crop, because it came at the time when other crops were scarce. The mangolds that did best were Long Red, and they seemed to do better than Yellow Globe Then he advocated kale. He then spoke on how these crops should be cultivated and prepared for stock The Professor said that our lambs, if shipped in January, would get home in March, and at that time they could get any price they liked for them on the London market. By having forage crops to top up the lambs with we could get them fat at the time it would suit the market best. He believed it would be a mistake to imitate the North and have the lambs dropped in autumn. It was the coldest time, and the lambs would not develop into the sheep that they should.

Mr. R. CAMPBELL had sent 116 lambs home in January, and forty-seven pelts had realised 2s. 5d. each and sixty-nine brought 1s. 7d. each, and the fat £1 5s. 10d., or an average of 2s. 1d. for 116 lambs without the carcass. He did not know yet what the carcass would realise. He had also found out that it was better to ship home through the Export Depôt than through the middleman.

In reply to Mr. Greenham, the PROFESSOR said that he had not found any difficulty in regard to the kale going to seed. He believed that rape and kale suffered more from aphis and blight

At this stage the Conference adjourned till 2 o'clock.

AFTERNOON SESSION.

Work of the Bureau.

Mr. R. CAMPBELL, Millicent Branch, read the following paper:—

To the enthusiastic members of the Branches the contents of this paper may not be of particular interest, as they probably have caught hold of the objects for which the Agricultural Bureau was established; but it is supposed that there are many still who have yet to get a firmer grip of the work that lies ahead, which, when done, will be of incalculable benefit to producers generally. There are many members and non-members who appear to think that the principal reason for the existence of the Bureau is to dispense seeds at public cost for individual use, judging by the few reports of seeds redistributed, and also of reports on seeds received, and the writer has had not a few personal applications from non-members for "some of those seeds the Bureau is giving away." It may be here stated that many of the parcels of seeds received by Branches would hardly grow enough to feed one man, the object of distributing these seeds being to introduce new kinds, to be grown and, if worthy, to save seed for redistribution, and also to introduce new plants not hitherto cultivated in the colony. Many of these have been found worthless for our climate, and this information has gone forth to all and sundry through Bureau reports in city and provincial papers Several plants have been boomed by seedsmen and newspapers from time to time, three of which may be mentioned - Lathyris sylvestris, Sacaline, and Canaigré - each of which was tried and proved "no good." These trials, made by members of the Bureau, have been published, and have saved many others from being victimised.

The dissemination of accumulated evidence on the most popular and useful kinds of fruit trees to plant is a work of great value that the Bureau has done, and whether it is for home use or from a commercial point of view that trees are planted, no one need now plant inferior kinds. This, too, has been of considerable help to nurserymen, because, knowing which kinds will likely be in demand, they have been able to raise more of the better kinds, and so possibly also saved the reputation of some of the less reliable members of the craft.

The knowledge on the treatment of fungoid diseases and insect pests accumulated and distributed is of great value to those engaged in horticultural pursuits, and in the *Journal of Agriculture* there is now such a fund of information that no one need despair if some or all of the plagues of the fruitgrower come down upon him.

Information on stock complaints and diseases has been dealt with, and much information has been given through the department of the Chief Inspector of Stock, which at once stamps it as reliable and valuable.

Stock-breeding, dairying, fruit-growing, bee-keeping, &c., &c., have been dealt with by many Branches and by the Government experts that it can be forcefully stated that never in the history of the colony has so much and valuable information been put before the public in such an able manner and at comparatively small cost.

Perhaps the most practical and profitable work of the Bureau is the publicity that has been given to the good work done and successful results achieved by the use of artificial fertilisers at the Agricultural College, as well as by our Peninsula friends and others, that now the practice has become almost general. All the foregoing are works that the numerous agricultural societies throughout the colony should have attended to, in addition to holding their annual or semi-annual shows, and it is a moot question as to whether at least a portion of the £1,500 now given to these societies would not be better spent by adding it to the amount at present allotted to the Central Bureau; but he will be a bold and able man who will take the matter up and bring to a successful issue against the opposition that such a proposition will raise.

The writer's opinion is that the aforementioned matters are not by far the most important work that the Bureau has to do: a work that at present can hardly be said to be in its inception. The greater, the higher, and *the best work* the organisation has to do is the uniting and consolidating the vast army of producers into one body that may be, first, their own exporters and salesmen, and, secondly their own importers and distributors to a very large extent. They will then receive more for the product of their own labor, they will live at less cost, and will be able to compete in the markets of the world against cheap land and labor. But this is a lesson they are slow to learn.

To this end the Bureau is not the organisation itself. Its work is to advocate, to instruct, and encourage and let those directly concerned in the benefits to be derived, organise and work the matter out. Every district should have its producers' agency, by and through which stock and produce could be sold; fertilisers, machinery, &c., could be bought and distributed. It could assist and encourage the dairying industry, build up on better lines sheep-husbandry and stock-raising, open facilities for an export trade; in fact, it could be all and do all the ubiquitous middleman is and does to the great advancement pecuniarily and socially of its members. When this comes about the Bureau will have done its best and greatest work.

A short discussion, in which nothing new was introduced, followed.

General Fruit Culture.

Mr. Geo. Quinn, Horticultural Inspector, said that he felt that what he would say that day might cause him to stand corrected. It was his first visit to the district of Lucindale, although he was slightly conversant with the Penola and Mount Gambier districts. Before proceeding with his remarks he wished to refer to what Mr. Molineux had said as to the results that had followed the spraying of diseased fruit trees in the Barossa district. Mr. Molineux had perhaps estimated the benefits rather high, and it was well that they should be within the mark. He considered the fruit crops in the Barossa district, had increased as a result of spraying the disease-affected trees, to the extent of £7,000 or £8,000 per annum. Mr. Quinn then went on to speak on fruit culture in a general way. He had seen one or two gardens in the district that had astonished him greatly. On the matter of cultivating fruit, it was first necessary to start with some definite object, either to cultivate for domestic purpose, for local supplies, or for export. Fruit production in its primary stage confined itself to domestic supplies, then as the grower found out the kinds of fruit best suitable for cultivation in his district and gained experience, if he was successful in that respect, he extended his orchard. To know the kinds of fruit that thrived best in the district was the keynote to success in fruit culture. It would appear to him that the country in their district was wet, and it would be useless to plant on the wet flats. In many wet districts they could underdrain, but in their district that could not be done, as there was no fall. The only chance of growing fruit successfully was to confine their operations to the hillocks. He believed the district would produce excellent fruits of many kinds. Apples and pears succeeded well, and he believed the climate would also suit plums. He suggested that they should stick to the higher ground. One of the first considerations in fruit culture was the providing of shelter for operations, and he thought, perhaps, belts of wattles would make as good a shelter as they could get, as they could be thinned out and the bark utilised. Then came the preparation of the soil. He thought that would be a simple matter. If they broke the surface well the remainder of the soil would take care of itself, as far as could be seen. He would suggest, however, that they should break up the ground evenly, because where it varied much digging of holes in clay soils would make drowning pools. On the selection and planting of trees he would advise them to get small and good trees at the nurseries, and they would find that they would get the best results. He had not much faith in the trees bought at auctions and such like places. The trees should be clean on the bark, and sound and young. He had seen stunted trees there that were four or five years old before they came from the nursery, but he believed in the trees being put in young. On the subject of planting, in a district like theirs, where they got a good rainfall, they could plant the trees closer together than in districts where the rainfall was less. He would suggest that they should plant them from 16ft. to 18ft. apart, and the stem of the tree put in should not be started above the height of an ordinary man's knee, and the trees trained low and sturdy. If they put in a long-stemmed tree the result was that they got a long bare tree. He had seen a number of trees in Mr. Newman's garden from which they could get a good pattern. There was not the least doubt that the cultivation of the ground was a most important factor in fruit-growing They would find it necessary to plough two or three times for weeds, &c., and they should not be afraid to put the plough in deep. They should keep the cultivation going in the summer time to keep the ground loose and save the moisture. Soil moisture was also another important factor in fruit-growing, and one of the main points in this connection was to keep the free water, or the water which came from the clouds and drains down in the ground, and utilise it for supplying moisture for the trees from beneath. Parrots were bad all over the colony, and were a source of constant annoyance to fruit growers. He thought if the matter was looked into it would be found that their natural feed had become scarce and they had been driven to the fruit. In the hills around Adelaide they had wattle birds which put the fruit growers to their wits end to know how to combat with them, but their attacks were intermittent. Then there were other birds which did good by eating the insects off the trees. He was strongly of opinion that, with cleanly cultivation and careful attention to the trees, fruit growers would not be troubled so much with many of the pests which were so prevalent. But there were some fruit pests, such as the codlin moth, that could not be prevented by the methods of cultivation, for the healthy tree only produced more food for a pest which eats the fruit only. If, however, they brought codlin moth into a district like theirs it would be their own fault. If they were compelled to use fruit cases that came from codlin moth affected localities then they should disinfect them. The best plan would be to use new cases, and put the price of the case on to the fruit and let it go. On the matter of marketing fruit, great care had to be exercised in regard to grading, packing, &c. The position of their district gave opportunity for sending in fruits to the Adelaide market at a time when the same fruit could not be sent from other districts. This applied to apples and pears, and he thought Gravenstein, Cox's Orange Pippin, Ribston Pippin apples, and Williams' Bon Chretian pears, could be grown in the South-East and placed in the Adelaide market to fill the gap from the middle of February to a month later, when dessert apples and pears are scarce.

Mr. **Molineux** said that he noticed that at a meeting of the Agricultural Bureau in Mount Gambier the old lie that codlin moth lived on stringy bark had been quoted. He gave the statement a most emphatic denial. It had also been stated that the moth lived in dried fruit, potatoes and tomatoes. This was also wrong, as they are the caterpillars of other moths.

Mr. **Hall**, at the request of the Chairman, explained that he had tried all sorts of remedies on his trees for woolly blight, and after resorting to washing the parts affected with boiled oil, he found that had destroyed the blight.

The point was discussed, and Mr. **Molineux** and Mr. **Quinn** did not think the cure was practicable.

Mr. **Campbell** found resin wash a success. He also suggested cyanide of potassium, but Mr. Quinn advised it as being too dangerous to use.

Mr. H. **Smith** related how he cured some of his trees of American blight by boring small holes in the tree and filling them up with sulphur, but Messrs. Molineux and Quinn were too sceptical for Mr. Smith to persuade them to believe that his remedy was effective.

Mr. **Stanton** said that the parrots first attacked the Tatiara gardens five years ago, and it was then said there was no honey on the trees. Last year there was plenty of honey and the parrots were as bad as ever.

Mr. **Molineux** answered that question by an illustration that if a man was used to biscuits and then was fed on soft food and got used to it, it was not likely that he would go back again to the biscuits unless forced to.

The **Chairman** said a member had stated that he had obtained a caterpillar of the codlin moth and put it in spirits of wine in a corked bottle, and it had lived for two years.

Mr. **Molineux** could not believe that it could have been a codlin moth.

Budding v. Grafting.

Mr. A. **Johnstone**, Naracoorte, read the following paper :—

It has struck me that although a great deal has been written on the arts of budding and engrafting, nothing has been explained relating to the causes for union taking place between stock, scion, and bud, and I purpose in this short paper endeavoring to make that phenomena plain to those who may not have known it before. Many a cultivator of fruit trees has experienced considerable disappointment in finding, when his trees arrive at the bearing state, that many of them are not what he expected, and consequently there has been a waste of both labor and time. If he roots them out and replants, he may again meet with disappointment. The only other alternative, therefore, is to head the trees down and engraft upon the stems scions which he knows to be true to name. It is better in many cases to allow the old stem to produce young wood, and upon that growth insert buds. However, it is at this stage that the cultivator requires some knowledge of the two arts, viz., budding and grafting; and as most cultivators have a knowledge of some of the modes of grafting and budding, I will not attempt to describe them here. Therefore in the first place a stem or branch consists of two principal growths, the vascular (or wood) and the cellular (or herbaceous portion lying between the wood and outer bark), or I will suppose that we have here a transverse section of the apple or pear tree, which has an exogenous stem, that is to say, a stem whose circumference is built up by additions from year to year from outside its stem. Commencing at the centre, we have first the pith or medulla, which is surrounded by a woody sheath called the medullary sheath; it is from this part that all buds and branches take their rise. Next we get the heart wood, then the alburnum or sap wood, through which principally the sap is carried to the leaves; then we have a layer of organic matter called the cambium or generating zone, which in its turn will become the alburnum, and it is here where union takes place between both the bud or graft to the stem. Lastly, we come to the bark or fibre, from which to the pith or medulla a connection is kept up by medullary rays, which carry the elaborated sap to the interior of the stem, and which are generally known as the silver grain of the wood. Now I wish to point out that in engrafting no union takes place between the vascular or woody portion of the scion and stock; consequently the younger the wood operated on the better, as there will be a smaller scar left inside, and it is therefore imperative that the parts to be united fit exactly one another at the cellular parts. The whole art depends entirely upon the natural propensity of buds to strike root downwards and of making wood upwards, and in the case of engrafting they are found to strike root down between the wood and bark, and then form new layers of wood. As I have shown you, there are, running through the cellular tissue, what are known as the medullary rays; they are so thick that it is scarcely possible to miss uniting *them*, but in the case of the bark great care and attention should be taken to join the scion and stock together as neatly as possible; in fact, the more accurately they are adjusted so will the strength of your union be. But there are other reasons why the adjusting of the line between bark and wood of stock and scion should be done with accuracy: it is here that the roots of the scion strike downwards, and it is also here that the substance called cambium exists, and which supplies the food for the young descending fibres, so that the more accurate the adjustment the more ready will be the transmission of young fibres from the one to the other, and the less accurate the adjustment the greater the difficulty of this transmission, with the result of a weaker growth, which will be more easily broken by wind or other causes. In grafting, the two old woods, or vascular tissue, never unite; but the young fibres of the union grow over it and become new wood, forming a kind of ferule over the old, and there remains an unhealed scar inside, which very often, especially in the case of old trees, causes decay. Then again, very often the scion and stock in their growth do not swell together. Sometimes it is the stock which swells too quickly for the scion, causing suckers, cankerous growths, or other excrescences, and if the scion swells too fast for the stock it is either thrown off altogether or dies from strangulation. So that although we cannot altogether do without engrafting, it being quicker than seedlings and for propagating desirable plants and fruits we get the growth quicker, yet, if budding should fail and a season is lost, then we can graft at a time when budding is out of the question, and consequently save time. But I do not regard grafting as being suitable to stone fruits, or any plant which secretes gum. In grafting, although we get union, it is only in the cellular parts. With budding it is different, because no wood or tissue is cut; consequently there is none to heal. The incision made in the stock being only through the bark to the alburnum, and it is here that failures take place. If the bark does not separate easily from the alburnum (which separation is caused by the cambium being in full formation), and force is used, the alburnum is cut and the wood scratched, then decay ensues, and your bud dies. Care should be taken never to cut in to the wood. If your bud does not come easily or the bark does not run properly better to wait a day or two longer. The bud which is inserted, consisting of fibre or bark, adheres by the cambium to the alburnum of the stock, and union is completed, so to speak, by first intention. The bud as it swells sends its rootlets down and around the stock in the same way as the graft, the tissues of the one growing into the other until at length one cannot tell where the original ended and the new began, because, there having been no amputation of the wood, there is a full and natural communication from centre to circumference; therefore in the case of the bud there is not the same chance of getting irregular growths between stock and scion, they becoming more nearly as one. I may say that I have seen grafted apricots and cherries throw themselves off from their stock after having borne several crops of fruit, the formation of gum caused by the dead wood inside being the cause of this. I would also recommend budding as being more quickly done and a cleaner operation, requiring fewer materials and less attention afterwards.

There was a very short discussion on the paper, which was generally pronounced to be a good one.

General Dairying.

Mr. G. S. Thomson, Dairy Instructor, gave an address on this subject upon similar lines to those given at Mannum, Gladstone, and Quorn, and a short discussion followed.

Advantages South-Eastern Producers will Derive from Federation.

The Hon. A. W. Sandford, M.L.C., before the conclusion of the afternoon session, spoke on the advantages producers would derive from federation. He said it was one of the rules of the Bureau that politics should not be discussed at any of the meetings, and he knew it was a rule that the General Secretary observed most rigidly. At the same time he had known him allow Ministers to talk by the hour on politics at their meetings. In speaking to them on this subject he could not claim to be an expert, but he wanted to give a note of warning to the producers. That federation would make marked changes in the markets of the colonies they must all admit, and that advantages would accrue they must also admit. Federation would bring about with it disadvantages in some cases, as well as advantages, but the general good that would result from its consummation would be much greater than the small disadvantages it might bring. In the district of Mount Gambier the farmers looked with doubt at the future of potato-growing. He thought they had reason to look at it with doubt. With Tasmania in the union with a climate so suitable for the growth of the potato, and the soil adapted to its cultivation right on the coast, where the potatoes could be loaded and carried to Port Adelaide at a less cost than they could be taken from Beachport, it was a matter of consideration for the Mount growers. He was not prepared to say that federation was going to stop potato-growing in the Mount Gambier district, but it would be necessary for them to compete with the larger markets of Australia. He was of the opinion that plenty of consumers would be found for the potatoes grown in Tasmania and Victoria, to say nothing of the Mount Gambier district. Queensland was fed with potatoes and other products largely by New Zealand.

New Zealand was not coming into the federation, and as the federation tariff would almost assuredly be a protectionist one, the outlook for the potato industry was not so doleful as they would think. Even if potato-growing did receive a check, he did not believe the producer would lose any profit. Malting barley had been grown in the South-East of a quality fit for the highest malting purposes, but the high duty ruling had prevented the export of the produce, with the result that if a little extra was grown the produce had to be at the mercy of the buyer. With all the ports open they would find that there would be a good demand for malting barley in the South-East, and producers would get a good price. He thought that the portion of the district from Naracoorte to Kingston would benefit more largely by federation than any other part of the South-East, but of course all the South-East would participate in the benefit. Australia was at present exporting large quantities of forage. They could grow hay and oats of good quality quite close to the railway line in this district, and with Kingston as a port of shipment it gave the producers of this part an advantage over the farmers in other parts. They were told there were difficulties at Kingston, such as high freights, shipping and other charges, but with an increase in trade these charges were bound to come down. He believed with federation the trade of Kingston would be largely increased, and a reduction in charges would, as a matter of course, follow. With federation also there would be no border regulations to interfere with the Wimmera trade, and as that district was situated nearer to Kingston than any other port, it was only feasible to conclude that Kingston, with a railway looped on, would command the trade of the Wimmera. One of the great advantages of federation to the South-East would also be the foreign meat trade. The district was capable of raising the sheep and lambs for export, and with the facilities that Kingston offered as a port the district would be able to have its own refrigerating depôt there, and ship direct from Kingston, which would be cheaper than sending to Adelaide. The industries that would get a check by federation would be those in and around the city, and that would be only a small matter compared with the benefits generally that federation would bring about.

This concluded the afternoon session.

EVENING SESSION.

The evening session was largely attended by members and visitors, a considerable number of ladies being present.

Arboreal Shelter.

The General Secretary read the following paper by Mr. Walter Gill, F.L.S., F.R.H.S., Conservator of Forests, on "Maintenance of Efficient Shelter in some South-Eastern Districts":—

The question of maintaining efficient shelter on the low-lying country in the South-Eastern district is one of great importance The present position is that in many parts the various trees that originally sheltered the district have been destroyed by various agencies, and in others the existing trees appear to be fast disappearing. Some recognise at once that the ultimate total clearance of the timber will be followed by very serious consequences. For the information of those who have as yet failed to understand the gravity of the question involved it may be pointed out that by the total deforestation of a large area of level country both the mechanical power and the evaporative influence of the wind will be immensely increased for evil. Once remove all timber shelter and the wind's mechanical power will prove most injurious both to animal life and human property, while its evaporative power will prove vastly more exhaustive to soil moisture. Not only so, but the increased violence and penetrating force of the wind in the cold winter time will be so great that wide mortality may be anticipated among stock of all kinds; and even those that do not die will feel so acutely the intensity of the cold that they will be unable to keep in good condition. Breeding stock will in all probability bequeath a weakened constitution to such of their offspring as may survive, while the young stock that do live will inevitably grow up stunted in growth compared with their usual standard. It is generally considered that clearing the timber increases the growth of grass This is true in many cases; but, on the other hand, it is also true that though the grass is thicker, yet—when there is nothing to protect it—in summer the hot wind and sun can and do burn it up sooner. Supposing it is admitted that the grass is increased in quantity, did it never occur to those who advocate clearing off every stick of timber as a nuisance to be got rid of with all speed that the animal's appetite is increased proportionately, because it misses the shelter on the bleak plain, and, feeling the cold more acutely, requires more food to keep up a sufficient supply of animal heat? Instances can readily be quoted to show that an animal may be surrounded by abundance of feed, and yet fail to fatten through excessive cold, but this fact is probably so well within the experience of most as to render it unnecessary to do so. The tornado-like vehemence with which wind can destroy human dwellings and devastate the surface of the earth may be readily developed when it has free scope over a great extent of level country, and therefore for the safety of property as well as the preservation of stock this question demands the most careful consideration. Another and, from some aspects, quite as important a point as those already alluded to is the influence of shelter on human comfort, and here surely the infinite advantage presented by a well-sheltered home when compared with a naked house on a bleak plain is so apparent as to require no argument. In considering how best to deal with the question before us, it soon becomes evident that the conditions surrounding it are somewhat difficult to deal with. The country under discussion is, for the most part, of a very level character; the soil at the dead level is often of an intractable kind, of shallow depth, and, worse still, often immediately resting on limestone, or frequently on a cold impermeable clay. These conditions, it need hardly be said, are most unfavorable to tree-growing; this is easily proved by careful observation throughout the district, which will show that the best trees, both naturally grown and artificially planted, are to be found on the rising ground, whereas at the swamp level they are generally stunted or entirely disappear. The intractable nature of the low-lying lands arises from the fact that they are generally under water for a considerable part of the year, and thus get into an exceedingly consolidated state from want of proper aeration. While the moisture is present the ground is kept in too cold a state for satisfactory growth, and when the excessive heat evaporates the moisture the shallow depth of the soil renders it an easy matter for the sun to penetrate it, and make it as much too hot in the summer as it was too cold in the winter. When we seek the best way to alter these conditions one of the first means that suggests itself is cultivation, which may prove helpful in some instances. The surface soil may be ploughed to a depth to be determined by the distance of the clay subsoil from the surface—shallow if the soil be but shallow, and deeper if it will permit it; the clay subsoil can then be trench-ploughed at the same time to facilitate the descent of the moisture to the lower levels, and thus sweeten the surface, while providing a reserve of moisture against the dry weather. In many cases it may be found desirable to allow the land to fallow and then to repeat the same treatment during the next season. With some swamp lands it is years ere they become really fit for successful results. But cases may occur in which the soil is very thin, say only 3in, just lying on the top of a limestone substratum. If this limestone be only a thin crust, which can be broken through, good work may still be done either by a stump-jump plough or by trenching out the stone by hand labor, but should a solid reef occur the undertaking will prove practically prohibitory. Again, conditions may occur in which systematic drainage, combined with after-cultivation, may be the only true agency to improve the soil; but it may also happen that such a course may be out of the question, because the dead level of the locality leaves no lower level to which to drain. There is still another method that may be adopted, and that is to *make* a suitable soil by carting the necessary material, and thus raising the surface to the desired height. It is not anticipated that these methods can be followed out on any *extensive* scale by individual effort, but it is quite within the power of any enterprising planter to treat *limited areas*, from a few rods to an acre, or even more, in one or more of the ways now suggested, and thus by little and little to create year after year clumps and belts of trees, placed in such a position relative to each other as to satisfactorily break the force of the wind. The treatment of this question has been merely general and indicative, briefly stating the problem to be solved and the most likely way of doing it so as to make the land more suitable for tree culture. On a future occasion I shall be glad to offer some remarks on the kinds of trees which are indicated as best suited for planting where more favorable conditions have been created.

Influences of Forest Trees.

The General Secretary followed with some remarks upon the effects of denudation of forest lands. Timber for fences, firewood, bridges, and many other purposes was becoming scarcer and more scarce every year, and he doubted if enough could now be obtained in the colony to replace the fences which were now very old. Professor Lowrie, Mr. Quinn, and the Hon. A. W. Sandford took prominent parts in the discussion which followed, and several others in the assemblage helped to make matters lively and, it is to hoped, instructive.

The Next Conference.

Mr. R. **Campbell** said it would be six years before they would have another Conference at Lucindale again. He thought the South-East should be divided into two districts for Conference, and that one be held in the north of the district and the other in the south. The Conferences would then be more frequent in the different towns.

The **Chairman** thought the matter would be one for the Branches to decide.

Mr. **Campbell** then moved "That the next Conference be held at Penola." Seconded by Mr. **Schinckel** and carried.

Branch Libraries.

Mr. **Campbell** said that he would like to bring before the Conference the matter of having a library connected with the Branches. They had one at Millicent containing twenty or thirty volumes, and members found it a great assistance.

Mr. **Molineux** said that would be a matter for the Branches to consider.

Vote of Thanks.

Mr. **Molineux** proposed a hearty vote of thanks to all who had taken part in the proceedings that day, and to the lady visitors. The arrangements had been perfect, and it was a matter of congratulation for the members of the Lucindale Branch. The vote of thanks was carried by acclamation.

On the motion of Mr. **Molineux**, a vote of thanks was passed to the press, and Mr. D. **Caldwell** acknowledged it on behalf of the *Naracoorte Herald*, and Mr. A. Watson on behalf of the *Border Watch*.

On the motion of Professor **Lowrie** a vote of thanks was passed to the Chairman, and the proceedings terminated.

Dairy Records.—The following, taken from *The Dairy*, are the milking records of Lord Rothschild's famous herd of Jerseys and Red Polls for the year ending September 24 last. There were twenty-nine Jerseys in the herd all the year, and from them the splendid average of 6,209lbs. each was obtained. The heaviest individual yield was 11,723lbs., the famous prize cow, Regina Sultana II., having placed this quantity to her credit in 349 days, equal to 33·59lbs. per day. No other cow of the breed quite reached 10,000lbs., Sultana XIV. coming nearest to it with 9,097lbs. in 293 days. The thirty-six Red Polls credited with a full year's achievement gave the equally gratifying average of 7,544¼lbs. each. The heaviest yield in this case was 13,126lbs. in 347 days, equal to 37·82lbs. per day, by Faith; Rosette giving 12,233lbs. in 290 days, equal to 42·18lbs. per day; and other two, 11,812lbs. and 10,665lbs. respectfully. Mr. W. M'Kenzie Bradley's Jersey cows at Leylands, Kent—twenty-one cows and heifers—averaged in 1898 775½galls. per head against an average of 755galls. for fourteen head in 1897. The heaviest individual yield was 1,612½galls., and the lowest 418½galls., but, although the range appears to be wide, in reality the uniformity of the yield is a conspicuous feature of the results, and shows clearly the advantageous effects of careful selection and milk registration.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, MARCH 7, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Hon. A. W. Sandford, Professor Lowrie, Messrs. H. Kelly, J. Miller, M.P., T. B. Robson, and A. Molineux (Secretary).

Standard Samples of Wheat.

The Secretary called attention to resolutions passed at various Conferences in respect to the standard sample of wheat, and after some discussion it was decided to take no action in regard to arranging for suggested meeting of representatives of farmers and wheatbuyers until after Strathalbyn Conference.

Professor LOWRIE asked how many Branches forwarded samples to the Chamber of Commerce.

The Secretary stated that the samples were sent by the Branches direct to the Chamber of Commerce, upon the request of the Corn Trade Section of body, so that he did not know which of the Branches furnished them.

Professor LOWRIE said—I wish in this relation, with the permission of the Chairman, to refer to certain letters in the *Register* by Mr. Hart. As a civil servant I would not have been in order, I understand, in replying directly to newspaper correspondents, but as I did not reply Mr. Hart, apparently unaware of the rule, concluded that I had taken "a lickin'" lying down, and goes on to write as follows:—"I can only presume now that neither explanation nor retraction will be forthcoming. I would therefore enter my strongest protest against such statements being made by a gentleman holding the position of Professor of Agriculture." But Mr. Hart may "protest too much," and from the evidence of his letters I should be very reluctant to accept his censorship in this matter. Mr. Hart sets out with some arithmetical examples which look like something for a boarding school Miss to exercise on; but the way in which he follows up his arithmetic, and begins to talk of "entering strong protests," "of misinterpretation of facts," "of machinations and of effects on the relations of classes," makes me think of Mrs. Malaprop's "inflammatory branches of learning—algebra, simmy, fluxims, and paradoxes." I had complained that the average of samples collected by the Corn Trade Section of the Chamber of Commerce was made the minimum for which ruling rates were offered, and that therefore the standard sample, 63lbs., must necessarily be under the average shipped, for which market rates were paid. This resulted in a loss to the colony of upwards of 2d. per bushel. I gave this estimate on these grounds—(1) If 63lbs. be made the minimum weight for buyers, their bulk sample must be over 63lbs., probably 64lbs. to 65lbs., yet the price is fixed on that 63lbs. sample in London: (2) The average sample contains a higher percentage of impurities; and (3) it contains a high percentage of bunt balls and smells badly of bunt, and therefore is of lower value than wheat free from bunt. Badly-bunted samples must have been allowed among those which went to form the standard sample, but nevertheless ruling market rates will not be paid for badly-bunted wheat. As Mr. Hart writes with such an air of authority it may be worth while to point out some of his blunders. He explains, for example, that heavy wheat derives its increased weight per imperial bushel from there being less empty space between the decreased number of grains. This will be news to most farmers, and some of them may ask for more. What, for example, about the decreased number of grains in a bushel of Velvet Pearl, which is a very small-berried wheat, but nevertheless weighs well in practice? Again he says—"Mr. Lowrie surely knows that wheat at 2s. 6d. means ½d. per pound, so that if the wheat were sold by the bushel measurement, which is not the case, the difference in value could not exceed ½d. per pound." Now I plead ignorance of the truth of any such deduction, and fear Mr. Hart is under some illusion when he takes S.A. rates. The standard sample is valued in Mark Lane, where at that time (the second week of February) Australian wheat was quoted at 31s. to 32s. per 496lbs. This is slightly more than 2s. 6d. per bushel; most of us would make it 3s. 9d. to 3s. 10d. per bushel of 60lbs., which means ¾d. per pound—one-half more than Mr. Hart allows and enough to make a considerable difference in his calculations. As Mark Lane, when we have wheat to ship, determines the price that can be offered here an extra 1d. or 2d. per bushel in Mark Lane will mean practically an extra 1d. or 2d. here, as the freight and charges will be practically the same. The 2s. 6d. per bushel is thus a wrong basis. Now for blunder No. 3. Mr. Hart sets out this sum in arithmetic—66 : 60 :: 46 : $41\frac{9}{11}$. By this pretty little sum Mr. Hart thinks he proves that "the better wheat (6lbs. per bushel heavier) will yield $\frac{9}{11}$lbs. more of flour per commercial bushel." Now, I am not a miller and do not pretend a knowledge of milling, and accordingly I referred to milling authority for the average yield, and I find that Australian wheat weighing 61lbs. to 64lbs. per bushel yields 70 to 74 per cent. of flour. Mr. Hart, however, is satisfied with 69·6 per cent. of flour and that for wheat not 64lbs per bushel, but 66lbs. It is fair reasoning, surely, to say that at the authoritative rates wheat 66lbs. will yield 76·6 per cent., and accordingly I argue that Mr. Hart has understated the yield to the amount of 7 per cent.—another upsetting matter for the truth of his conclusions In fact I find, according to reliable milling tables (my authority is a gold medallist of the National Association of British and Irish Millers), that when flour is at 28s. per sack of 280lbs., and offal at £4 10s. per ton, the net extra value of wheat yielding 1 per cent. more flour than another, the quality taken as equal, is 3·6d. per quarter, and therefore the extra value of wheat yielding 7 per cent. more flour is 3·6 × 7 = 25·2d., that is 3d. per bushel, and that without consideration of quality of flour. But in making my statement I was guided by the practice of wheatbuyers in the colony, and I fear the prayer of the wheatbuyers will become "Save us from our friends" when they read Mr. Hart's statement that the intrinsic value of the better wheat, 66lbs. per bushel, is $\frac{7}{10}$d. per bushel more than wheat of 62lbs. This is setting class against class if you like. The standard sample this year is 63lbs., but if a farmer offer a sample 59lbs. will he be offered within $\frac{7}{10}$d. per bushel of market rates? I fear he will be docked 3d. to 4d. per bushel however eloquently he may plead Mr. Hart's authority that he should be docked only $\frac{7}{10}$d. I will only say further that if we allow this $\frac{7}{10}$d. per bushel as the loss on our wheat through our inferior sample the total loss amounts to something like £17,000 to £18,000—enough to provoke a desire for change.

Members agreed with Professor Lowrie that Mr Hart's figures proved too much. If the heavier wheat were worth so little more it was manifestly unfair to dock severely where the samples were only 1lb. or 2lbs. less than the standard. It was also pointed out that under present conditions probably half the wheat was sold prior to the standard being fixed.

Extension of Agricultural Education.

The Hon. Minister of Agriculture intimated that it was proposed to hold a conference of representatives of various boards, together with the various specialists connected with the department to deal with the question of the extension of agricultural education, and asked that three representatives from the Central Bureau should be nominated. It was decided to nominate the Chairman and Messrs. J. Miller, M.P., and T. B. Robson to represent the Central Bureau.

Extracts and Translations.

The **Chairman** tabled the following extracts and translations from Foreign Agronomical Papers:—

341. *Age of Trees.*—The *German Horticole* estimates the life of the poplar at 50 years; elm, 335; maple, 516; birch, 576; orange, 620; cypress, walnut, and olive, 800; plane, 1,000; lime, 1,100; oak, 1,500; cedar, 2,000; sequoia and baobab, much longer.

342. *Green Manure and Fallow.*—Professor W. Edler, whilst admitting the advantages of green manuring to light soils, made experiments which showed that neither legumes nor mustard gave any advantage over fallow on heavier soils for subsequent crops; in fact, mustard was not nearly as good. Both fallowed and green manured plots had about 2cwts. superphosphate per morgen.

343. *Mangold Leaves.*—These, if fed to cows, increase the milk supply, but act injuriously if fed too liberally, owing to presence of oxalic and other acids and saltpetre.

344. *German Co-operative Farmers.*—At the sixth annual general meeting of the Bund der Landwirte, at Berlin, the following particulars were given:—Number of members, 188,000: year's revenue, £27,085; manures procured for members, 1,514,393cwts.; feeding stuffs, 32,967cwts.; seeds, 380,036lbs. The Central Consortships Fund, founded the year before, had an exchange of £401,111. The number of members present being so large it was necessary to make thirteen sub-divisions. The section dealing with manures had conducted 974 analyses of manures free of cost. Of these 82 per cent. were correct. Professor Maercker stated it is necessary to continue applications of phosphate for a year or two after having heavily manured with it. With turnips manured the second year with phosphates he obtained 211cwts. per morgen, against 103cwts. per morgen from land not manured the second year. The "new kainit," containing 40 per cent. of potash, gave better results from 1cwt. than were obtained from 3¾cwts. ordinary kainit. It does not cause the surface soil to cake so badly as the common form, is easier to distribute, and less costly to carry.

345. *Bores for Water.*—There are now 711 bores for water in Queensland—sixty-seven more than last year. Of these 439 flow naturally to the extent of 268,0 0,000galls. daily—enough to cover 562 square miles annually to a depth of 1ft. The total cost has been £1,044,822. For each pound spent there is a daily supply of 256galls. in a bad country, or 93,440galls. per annum The deepest bore is 4,860ft., at Bothwell; the shallowest is only 10ft. The average depth is 1,175½ft., and the average cost 25s. per foot.

Locust Fungus.

The Hon. Minister of Agriculture forwarded request from Terowie District Council that a supply of locust fungus should be imported in order to destroy the locusts which did so much damage in the North, and requested the opinion of the Central Bureau as to the advisableness of doing this.

In reply to questions, the Secretary said it had been proved both in South Africa and in Victoria that the fungus was very destructive to locusts, provided there was sufficient moisture in the air and soil to produce the humid conditions necessary to the rapid propagation of the fungus, but in dry weather it was practically valueless. Unfortunately in our northern districts the climatic conditions were, when the locusts usually appear, most unfavorable to the propagation of the fungus. It was decided not to recommend the importation of the fungus at present.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Mundoora, Messrs. H. T. Torr, D. Owens, and H. Haines; Penola, Messrs. T. H. Morris and W. P. Davis; Redhill, Messrs. J. Pilkington and J. N. Lithgow; Crystal Brook, Messrs. P. H. Clarage and F. S. Keen; Woodside, Messrs. J. W. Johnston and W. Rabach; Tatiara, Mr. L. Fergusson; Gumeracha, Mr. T. Wm. Martin; Colton, Mr. A. C. Riggs: Mount Compass, Messrs. F. M. McKinlay and J. Hutton; Morgan, Mr. Julius Arndt; Pine Forest, Mr. W. Lewis; Albert, Mr. R. C. Barnett; Brinkworth, Mr. W. Welke; Millicent, Mr. F. E. Wehl; Lyndoch, Messrs. F. Warren and H. Springbett.

Reports by Branches.

The **Secretary** reported receipt since previous meeting of ninety-four reports of Branch meetings.

REPORTS BY BRANCHES.

Swan Reach, February 10.

Present—Messrs. J. L. Baker (Chairman), P. A. Hasse, B. Schwarz, P. A. Beck, C. D. Halliger (Hon. Sec.), C. Drogemuller (Bowhill Branch), R. Barrow, and E. Dietrich (Bakara Branch).

Seed Wheat.—Several members reported that Dart's Imperial wheat had proved a very suitable variety for this district.

Burning Stubble and Grass.—The Chairman read a paper on this subject. This operation was beneficial for several reasons. Myriads of insects and small animals, such as grasshoppers, caterpillars, grubs. mice, &c., are destroyed by the fire; large numbers of roots, stumps, and mallee bushes are got rid of: in fact, if two good fires can be got to burn over the stubble where the bushes are growing most of them will be killed and the stumps will die out quicker than otherwise Then the burning leaves a coat of ashes, which does the wheat crop a lot of good. He found that he got a much better crop from land where the stubble had been burned than from where it had been harrowed and the straw, &c., taken off. The former portion was also free from grubs, which have done so much damage lately. In a district like this, with a rainfall of about 10in., if you plough grass or stubble under it does not decay, but leaves the ground too hollow, causing it to dry out quickly, besides which the hollows provide the best of shelter for mice, &c., in the winter. Where the stubble is burnt the land, if left for pasture, will grow grass much better and quicker than if not burnt. Every farmer in the district should burn his stubble and grass paddocks, especially where grubs, mice, and grasshoppers have been troublesome. February is the best time in this district for burning. [What effects will be observable on crops four years later? This is a subject well worthy of consideration by all Branches.—Gen. Sec.]

Meadows, March 5.

Present—Messrs. J. Catt (Chairman), T. B. Brooks, G. Ellis, T. A. Buttery, G. T. Griggs, T. Usher, G Usher, W. Nicholls, W. Pearson, G. Rice, and D. D. Murphy (Hon Sec.).

Branch Show.—Matters in connection with forthcoming produce and industrial show under the auspices of the Branch were dealt with.

Eudunda, February 20.

Present—Messrs. C. T. E. Lutz (in chair), J. A. Pfitzner, A. Pfeiffer, A. Kluske, W. Krummel, H. Martin, H. Hage, W. H. Marshall (Hon. Sec.), and eight visitors.

Visit to Homestead.—This meeting was held at the homestead of Mr. A. Kluske, members making a tour of inspection before ordinary business was taken. Amongst the items calling for particular notice were the young draught stock and pigs. Fruits of various kinds grown on the farm were sampled as well as the other good things provided for the entertainment of the visitors.

Wheat for Hay.—A discussion took place on best wheats to grow for hay. Members find most of the varieties cut for hay in this district carry little or no grain in the head, and would like the experiences of members of other Branches on this matter.

POISON PLANT.—The Hon. Secretary reported prevalence of Pimelia in some parts of the district, and suggested that members should gather specimens of any suspicious plants in their paddocks for identification, and take immediate and united action to get rid of any injurious species.

Penola, March 3.

Present—Messrs. A. E. Stoney (Chairman), W. P. Davis, T. H. Morris, S. B. Worthington, J. A. Riddoch, J. T. Morris, W. Miller, D. McKay, J. Sandiford, E. McBain, Dr. Ockley, and R. Fowler (Hon. Sec.).

PHYLLOXERA BOARD.—The Chairman reported that Mr. J. Darwent, a member of this Branch, had been nominated as a member of the Phylloxera Board. Some discussion on general topics ensued.

Albert, March 3.

Present—Messrs. J. Witherall (Chairman), W. H. Clarke, G. Holmes, F. Drogemuller, W. Farley, T. Cooper, J. Head, W. H. Stengert, R. C. Rasmussen, H. L. Smith (Hon. Sec.), and several visitors.

PLANTS FOR SALTY SOILS.—Mr. Drogemuller asked whether there were any fodder plants which would grow on the salt flats. He understood there was such a plant grown in India which took large quantities of salt out of the ground, rendering it fit for wheat-growing. [Mangolds will grow on such soils if not too salt, and will remove a considerable portion of salt. Saltbushes will probably do well, while Modiola decumbens is also favorably reported on.—GEN. SEC.]

CABBAGES.—Mr Cooper read extract dealing with cause of cabbage plants running to seed. This trouble was attributed to the plants getting some check, either from injury while transplanting, want of water, excess of water, &c.

Arthurton February 15.

Present—Messrs. W. Short (Chairman), T. B. Wicks, W. H. Hawke, J. Pearson, C. L. Palm, J. B. Rowe (Hon. Sec.), and one visitor.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. T. B. Wicks. Prior to the usual business members inspected the garden and outbuildings. The fruit trees and vines show the effects of the long-continued dry weather. The large shed, which includes the stable, barn, and machinery shed, came in for much appreciation, being under one roof, substantially built, and conveniently arranged.

STANDARD SAMPLE OF WHEAT.—This question was discussed, members being of opinion that the standard had been fixed rather low.

FORESTRY.—Members were glad to accept offer of sugar-gum and sheaoak seed from Central Bureau, it being considered that trees raised locally were more likely to succeed than those brought from a distance, as the latter might be several days out of the ground before being received. Mr. Hawke offered to supply small quantity seed of several kinds of Eucalypts from his own trees.

CATTLE COMPLAINT.—Mr. Pearson reported that one of his cows shortly after calving became stiff in the joints, and appeared generally out of sorts; she refused her feed altogether, and it was impossible to get her to take anything. Several cows have died recently in the neighborhood from some unknown cause; generally the affected animals are in good condition.

Grub Pest.—The Chairman called attention to damage by underground grubs. The grubs were brown in color, with black heads, and bore into the soil. They were clearing all the dry grass in many paddocks.

Woolundunga, February 15.

Present—Messrs. H. Aldenhoven (Chairman), T. H. Prosser, J. A. Prosser, J. Greig, G. Foulis, G. Lewis, A S. Gunning, J. H. Michael, N. Rogers (Hon. Sec.), and three visitors.

Tuberculosis in Cattle.—Mr. H. A. Dowdy, stock inspector, after inspecting a number of dairy cows in the district, and pronouncing them to be quite healthy, gave a lengthy address upon "Tuberculosis in Cattle," to the following effect. He said:—

This is the greatest scourge to which cattle are subject. In Europe 600,000 cattle examined gave 16 per cent. tuberculosis. In Australia the disease exists to a large extent, as amongst considerably over 120,000 head examined he had found tuberculosis to be much the more prevalent disease in the dry sunny north. Tuberculosis is communicable from the lower animals to mankind in several ways, and is then known as "decline," "consumption," and by other names. It may remain slowly acting on the system for many years, or it may carry off its victims in a very short time. It is caused by a bacillus or microbe, and in the early stages of attack is most difficult to detect, as there are no well-defined symptoms. The animal may really look well, be in good condition, with sleek coat, good appetite, moist nose, and have regular rumination. At this early stage the beast may cough a little, especially if fed on dry food, or when it attempts to bellow, or if unduly exerted. The cough only occurs when the lungs are affected, and the disease may be found in any part of the body. As the disease progresses, the cough will probably be more frequent, the coat will lose its lustre, become harsh, dry, and staring; the skin may be observed to adhere closely to the underlying tissues, the head may be depressed, the back arched, the nose sometimes dry, at others soiled by mucous exuding from the nostrils. There may be tenderness over the region of the kidneys. The eyes may be dull and sunken, with yellow scales about the lids. There is commonly an anxious, dejected expression in the face. The appetite is not so good, and rumination is more fitful. There is usually some inflation of the stomach, resulting from indigestion. The movements of the patient may be characterised by stiffness, and should the joints be invaded lameness will perhaps follow. When the latter occurs, the disease is usually of long standing. When the glandular system is attacked badly external manifestations are frequently exhibited in the form of enlargement of the salivary glands about the throat, neck, face, flanks, shoulders, and other places.

In the last stage there will be rapid wasting, and should the abdominal organs be affected diarrhœa or constipation may supervene or alternate with each other. Then the animal looks narrow-chested, flat-ribbed, and lanky.

In no instance, however, will all the symptoms enumerated above be found present in the same patient, and in many cases possibly very few of them.

The microbe or bacillus of tuberculosis is so minute that it may be carried by the blood into every part of the body, find a lodgment anywhere, and there establish itself. For that reason the flesh of a diseased animal must be dangerous to use (unless thoroughly cooked before use, whilst the milk should be heated to at least 190° F. for half an hour). If the disease is located in the udder, there will be one or many permanent nodules or lumps, which may be as small as a pin's head, or of considerable size. These continue to enlarge and become harder, and pressure appears to give but little pain. At first the milk appears to be normal, but in the later stages of the disease it is scanty, thin, and of a yellowish-blue color, from which a considerable amount of sediment is deposited when allowed to stand.

Should any suspicious swelling appear in the udder of a cow, the milk of which is used for domestic purposes, the owner should not fail to get a specimen of it tested for tubercle bacilli, and until that is done it should never be used unless it has been boiled ten minutes. Careful bacteriological treatment of infectious milk will usually reveal the presence of the bacteria; but even if the first search prove negative one is not justified in excluding the idea of tuberculosis while the suspicious tumored condition remains, as the disease-producing germs might for a time have left the lesion.

No cow showing a disposition towards the development of lumps, wens, tumors, boils, etc., should be used for domestic purposes until it is very conclusively shown, by careful modern tests, that she is free from tubercular disease.

Lumpy jaw (actinomycosis), pleuro-pneumonia, and hydatid diseases may, on a cursory examination, be mistaken for tuberculosis, but the microscope in the hands of a skilled man will settle the question; or inoculation of rabbits or guinea pigs with serum, &c., taken from the diseased animal will have the same result. Tuberculin treatment, however, gives the most reliable results. The process of manufacture is an exceedingly intricate and tedious one, requiring months to complete the article. When properly made and carefully preserved the virus retains its useful properties for years. Tuberculin is now made by Mr. Pound, Director of the Stock Institute, Brisbane, Queensland; formerly it was made only at the laboratory of its discoverer (Dr. Koch), and later at the Pasteur Institute, Paris; also at Copenhagen, London, and two or three places in America. [Mr. Dowdy then described the method of application of the tuberculin test and the observations that must be taken.—Ed.]

The following method of eliminating the disease is based upon the experience of two scientific veterinary professors, viz , Professor Bang, of Copenhagen, and Professor Fadyean, of London.

All animals on the farm or run showing marked symptoms to the naked eye of tubercular mischief should be immediately destroyed, and the carcases burned, not buried, because it has been proved that worms may bring the disease-producing germs to the surface from the decaying matter. The herd should then be tested with tuberculin. The animals of little value should also be destroyed and burned. Any valuable breeding cows which are found only slightly diseased should be separated from the healthy stock, by placing the former in a separate paddock and allowing no communication whatever between the two divisions.

As soon as a calf is born in the tuberculous section it must be removed from its mother, and fed on milk drawn from a healthy cow, if convenient

If nourished on its mother's milk, such must be heated up to at least 190° F. and kept at that temperature for not less than thirty minutes, so that any diseased germs present may be destroyed.

When animals in the infected division betray clinical symptoms of the trouble, that is, signs which may be noticed by ordinary observation, such animals should be destroyed. The healthy division is subjected to the tuberculin test every half year, and, in case any be found to react, they must be removed to the diseased section.

This scheme is based on three facts, which are now so well established that they are scarcely under discussion by persons who have taken the trouble to acquaint themselves with the subject.

First—That tuberculin is a thoroughly reliable diagnostic.

Second—That contagion plays the principal part in spreading the disease.

Third - That calves born of tuberculous cows are almost invariably free from disease.

The immense success which has already attended the rigidly scientific treatment of some of the worst scourges to which cattle are liable should inspire us with the hope that progress along the same lines will ultimately result in practically banishing the fell disease of tuberculosis from one domestic animal, and thereby materially lessen its ravages among mankind.

Port Lincoln, February 16.

Present—Messrs. W. Laidlaw (Chairman), J. D. Bruce, J. O'Shanahan, W. E. Goode, E. Chapman, and John Anderson (Hon. Sec.).

Skins and Hides.—Mr. O'Shanahan read the following paper:—

A great number of us have the idea that if we have only a few skins they will not bring prices equal to larger lots, but that is a mistaken notion. If we only send one good skin it is placed with the best, and top market value obtained. Recently I saw a lot of 320 skins sold in one lot realising about 4s. each, and they were divided between thirty-two different owners. Getting skins up well is so simple that it is a wonder any neglected skins find their way to market. When the pelt is off, hang by the neck with a nail in the shed, stretch across the middle and breach with two strong pieces of wood. A piece of fencing-wire stapled along the wood, reaching over the ends about ¼in., to fasten in the pelt. When dry, dress with skin wash. A tin of skin paste can be obtained for 1s. 6d., and will make sufficient wash for 150 pelts, something about ⅛d. per skin. I saw two bales of rabbit skins from one of Hogarth and Warren's stations, the get-up of which was worth copying. The skins were sleeved in the usual way, dried on wire bent like a bullock-bow, stretched belly to back, not side to side, dried with skin wash, tied in bundles of 1doz., and catalogued so many dozen bucks, so many does, so many dozen kittens. They brought top prices, while 80doz. badly got-up rabbit skins from another seller only brought 1d. per dozen.

Best Wheat for District.—After discussion it was agreed that the best wheat to grow in this locality is Purple Straw, with Steinwedel next.

African Sheepbush.—The Chairman tabled a sample of African sheepbush (Pentzia virgata) which he has had growing for several years, but considers it much too slow of growth to be profitable,

Brinkworth, February 8.

Present—Messrs. G. Freebairn (Chairman), A. L. McEwin, H. Shepherd, W. H. Pearce, J. Stott (Hon. Sec.), and one visitor.

Commercial Fertilisers.—Mr. G. Freebairn in 1897 drilled in some island guano, and obtained a crop of hay giving as 7 to 3 when compared with adjacent unmanured land. He would alternate superphosphate with guano. Mr. A. L. McEwin used superphosphate, but had he used more his average would have been far better. It was advisable to manure the whole of the land. Mr. A. W. Morrisen was sorry he did not manure the whole of his land. He sowed about fifty acres with 60lbs. super. per acre, and reaped about 16bush. per acre, whilst on unmanured land he got about 4bush. per acre. Mr. H. Shepherd said his experience was altogether in favor of superphosphates.

Wheats.—Nine members tabled collections of varieties of wheats for exhibition at Conference.

Brinkworth, March 10.

Present—Messrs. G. Freebairn (Chairman), A. L. McEwin, R. Cooper, J. Graham, A. W. Morrison, J. F. Everett, W. H. Pearce, W. Wundke, J. Stott (Hon. Sec.), and one visitor.

The Conference.—Messrs. Freebairn and McEwin gave an account of the Conference of Northern Yorke's Peninsula Branches at Bute, with which they were much pleased, but they commented strongly on the long delay in opening the proceedings.

Rainfall.—Condowie, January, 0·17in.; February. 0·19in,; March 6th, 0·64in. Brinkworth, January, 0·25in.; February, 0·20in.; March 6th, 0·59in.

Millicent, March 1.

Present—Messrs. R. Campbell (Chairman), L. Oberlander, G. Mutton, W. J. Whennen, H. Hart, and E. J. Harris (Hon. Sec.).

Mineral Phosphates.—The Hon. Minister of Agriculture advised members that samples of natural mineral phosphatic rocks, &c., would be procured and forwarded to Branches of the Agricultural Bureau.

Fertilisers.—Mr. Hart said the tables of fertilisers specified practically the same for potatoes and turnips, but he had little success with potatoes on his Wyrie land, whilst turnips grew well there.

Sheep-biting Dogs.—Mr. Harris directed attention to a device for preventing dogs biting sheep when working, by placing a piece of chain from the collar through the mouth and fastening it on the other side to the collar.

Wheat Bags.—The Hon. Secretary said that if wheat bags are dipped in a solution made of 1lb. alum in a gallon of water the mice will not gnaw them. Mr. Hart said if bags are folded evenly and stacked on the floor as they come from the bales, kept 6in. from the wall, and separated by the same distance from other stacks of bags, the mice will not gnaw them. If bags of wheat are stood upright, even in three tiers, mice will do very little damage.

Rainfall.—Millicent for February, 0·380in.; Mount McIntyre for February, 0·430in.

Sheep-feeding Experiments.—The Chairman read the following from a newspaper:—

Mr. Geo. Valder, the Principal of the Hawkesbury Agricultural College, New South Wales, writes the following:—"On the 22nd of June last, thirty Romney Marsh and eight Shropshire lambs were weighed and hurdled on an acre of paspalum grass, and when this was eaten down they were moved to a half-acre plot of white mustard, and from this to an acre plot of rape. They were then weighed again, and it was found that the Shropshires had gained 30lbs. each and the Romneys 20¼lbs. each, *i.e.* in feeding off one and three-quarters acres, thirty-eight sheep had made a total of 847lbs. in forty days. If we reckon the weight gained at 1½d. per pound this will give £5 5s. 11d. for the acre and three-quarters, which I think a splendid return, especially when we consider the following points:—(1) The droppings of the sheep form a valuable manure. (3) There is no expense in harvesting the crops. (3) The rape and mustard could give a second or even a third crop if required, and the paspalum is perennial."

Mount Pleasant, March 9.

Present—Messrs. G. Phillis (Chairman), H. Drogemuller, P. Miller, J. F. Miller, J. Maxwell, W. Royal, F. Thomson, and H. T. Hull (Hon. Sec.).

OATS.—Hon. Secretary said he had sent samples of oats grown from Tasmanian seed to several northern farmers. Mr. J. P. Miller had sowed 2bush. 3lbs. of Tasmanian oats and reaped 11¼ bags; but, owing to dry weather, the sample was not as good as the seed, whilst the straw was too coarse, probably owing to sowing too thinly. Mr. P. Miller sowed 5¼bush. Tasmanian oats and 4bush. Champion oats on the same day on equal areas in the same locality. The return was twelve bags Tasmanian and sixteen bags Champion oats. A fortnight later he sowed 2¾bush. Tasmanian oats which yielded seven bags. Messrs. Thomson and Maxwell said their crops did not develop sufficiently to reap with the machine. Members all spoke highly of the Tasmanian oats.

SPECIAL EXHIBITS.—Members agreed to make special exhibits at the annual show of importations and results of experiments.

WHEATS.—Mr. Thomson reported that Clucas Early wheat matured a fortnight earlier than usual, and grain filled well, with an average of 12bush. per acre. Eclipse was a week later and somewhat blighted. Petatz Surprise ripened at usual time, and averaged 17bush., with a light crop of straw.

Wilmington, March 12.

Present—Messrs. J. Hutchens (Chairman), J. McLeod, J. Zimmermann, G. A. Lauterbach, R. Cole, J. Schuppan, A. Paull, R. G. S. Payne (Hon. Sec.), and one visitor.

PICKLING WHEAT.—In reply to question asked through the question box as to best method of pickling wheat a number of methods were submitted, the following being considered the best:—(*a*) Have your wheat in a bran or pickle bag and plunge it into a cask, wide at mouth, containing pickle made by dissolving ½lb. bluestone in each 2galls. water, move the bag about in the pickle until every grain is wetted. (*b*) Spread the wheat on the floor—a cement floor for preference—moisten with 2galls. of same strength pickle to each bag of seed, stir thoroughly with shovel or other instrument so that every grain is thoroughly wetted. [In addition the bags into which the seed is put should also be pickled; otherwise the grain may be re-infected and the previous pickling rendered useless.—GEN. SEC.]

QUORN CONFERENCE.—The Chairman gave an interesting report on proceedings of the recent Conference at Quorn. He hoped that the Branch would be more largely represented at future Conferences. A long discussion ensued on the question of the standard sample of wheat, it being contended that there was a danger of the standard being fixed too low, with the result that our wheat would get a very bad name. A resolution supporting the recommendations carried at Quorn and Gladstone conferences was passed by a majority of one.

Dairying.—Mr. Lauterbach read a paper on this subject, as follows:—

It would not be wise to go in for dairying in all parts of the North, but we have large tracts in our northern country which are well suited for the dairy industry, especially the country for many miles surrounding Wilmington. Here, and in many other parts, cows could be kept, either as a separate industry or in conjunction with farming, with very satisfactory results. I feel sure from long experience that if farmers will only give dairying a fair trial they will find it to be a paying concern.

Those who keep cows for butter purposes must go in for systematic feeding upon food other than dry grass during the late summer. This will not only increase the quantity of milk obtainable from each cow, but what is of more value, the qual ty of the milk will be considerably improved. I would strongly recommend farmers going in for cutting some of their dirty crops in the spring season, and converting it into ensilage, using this as food during the summer months, when food is both scarce and poor in the North. It would, most undoubtedly, pay them better than reaping for grain at present prices.

Farmers should keep good cows, because it costs as much to feed an inferior animal as the very best. The best quality of milk for butter is obtained from the pure-bred Jersey, but I would not altogether recommend the pure-bred animal. The Jerseys are small animals, and as a rule they are not heavy milkers. I would rather recommend a cross with the Shorthorn milking strain. The size of the beast would then be better, and I think the quality of the milk would be nearly as good, whilst the quantity would be considerably greater. Then, if the farmer wished at some period to sell some of his stock to the butcher, he would get a better price on account of the improved size.

One great drawback to some of your milk producers is that they have separators of their own, and send the cream to different butter factories. In the hot weather it becomes over-ripe very quickly, and will then only make a second or even third class butter. Such butter is often shipped to England, and helps to give South Australian butter a bad name. I am pleased to see that now all butter of this character shipped through our Government depôt will be branded as "Pastry." I strongly support Mr. Thomson's remarks, at the Quorn Congress, that the buttermilk left in the butter at once interferes with its keeping qualities.

A great point to be considered by our milk producers is scrupulous cleanliness. The skin of the milker must be perfectly clean, and the cans into which the milk is placed must have been well scalded, and then exposed to the fresh air.

In selecting a cow for milk select one with brown, not white teats (all other points being equal), as those with white teats are apt to become sunburnt, and so often become very sore.

Do not be in a hurry to use the milk from newly-calved cows for butter, as too often the butter has a strong flavor which is not agreeable.

Before closing my paper I should like to say that there is a splendid opening in this part of the country for a bacon-curing factory. It would be a grand thing for the farmers, and would bring in good money.

A good discussion ensued on the making of ensilage. It was admitted that it would pay to make ensilage when green stuff was available, but they required an old-time wet season to give the rank herbage so peculiar to the North a chance to grow. Mr. C. H. Tuckwell called attention to article in November, 1899, issue of *Journal of Agriculture* on the cultivation of Johnson grsss; matter to be discussed at next meeting.

Exhibits.—Mr. Paull tabled very fine samples of cooking apples grown in the district without irrigation. The Hon. Secretary tabled Rattlesnake watermelon; sampled by members and pronounced first-class quality.

Dawson, March 3.

Present—Messrs. R. Renton (Chairman), J. Collins, P. J. Byrne, C. W. Dowden, C. F. W. Just, W. Kelly, and A. F. Dempsey (Hon. Sec.).

Hailstorm Relief Fund.—Matters in connection with fund raised locally for relief of sufferers from severe hailstorm. With donations in cash and wheat, 144 bags of seed wheat have been distributed to nine different farmers who lost all or nearly all their crops through the storm. The wheat has been given free to the sufferers, but most of them have stated their intention to repay it should the harvest be sufficient to enable them to do so.

Mount Compass, March 9.

Present—Messrs. M. Jacobs (Chairman). S. Arthur, R. Cameron, C. S. Hancock, A. J. Hancock, J. Hutton, W. Gowling, A. Sweetman, R. Peters, F. Slater, F. McKinlay, H. McKinlay (Hon Sec.), E. Hargreaves (Port Elliot Branch), Geo. Quinn (Horticultural Instructor), W. L. Summers (Inspector of Fertilisers), and nine other visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. C. S. Hancock, and prior to usual business members inspected the orchard. The holding is situated some little distance back from the main road through the Swamp to Port Victor, in well-timbered country, the change from poor sandy soil with light scrub being very abrupt. The orchard consists of about fifteen acres of apples and a few citrus, plum, apricot, and peach trees, and is splendidly sheltered except from the north. The soil is good strong loam over rotten shale and clay subsoil, and the apple trees appear to do well. The slopes are rather steep, entailing extra labor in cultivation, &c. Practical demonstrations in summer pruning, breaking of shoots to encourage formation of fruit-buds, &c., were given by Mr. Quinn, which were much appreciated. Mr. Quinn expressed himself as favorably impressed by the growth of the apples, and thought there was a considerable area of equally suitable land in the neighborhood. Various matters dealing with commercial fertilisers were referred to by Mr. Summers, and a vote of thanks to the host and hostess and to the visitors brought a very instructive and enjoyable meeting to a close.

Stansbury, March 3.

Present—Messrs. H. C. Pitt (in chair), P. Anderson, J. Sherriff, J. Henderson, C. Faulkner, G. Brundle, J. Antonio, and P. Cornish (Hon. Sec.).

CLEANING CASKS.—Mr. Anderson wished to know best and easiest way of cleaning casks.

NEW GRAPES.—Mr. Pitt tabled splendid samples of grapes from fifteen varieties of vines grown from cuttings received from Central Bureau three or four years ago. Taking into consideration the dryness of the season, the fine quality of the fruit is more worthy of notice, the bunches being fine and the berries large and attractive. One member thought several of the varieties would be very good for wine-making purposes.

POULTRY DISEASE.—A member asked for remedy for disease in poultry, supposed to be roup. Mr. Sherriff suggested sulphate of iron and sulphur, which had proved very good for similar diseases.

COAST DISEASE.—Mr. Sherriff had found sulphate of iron a good remedy for this trouble in sheep.

Mallala, March 8.

Present—Messrs. H. B. Moody (Chairman), S. Churches, G. Marshman, S. Temby, A. F. Wilson, Jas. McCabe, M. H. East, J. Jenkins, A. Moody, G. W. Bischof, W. Temby, W R. Stephenson (Hon. Sec.), and two visitors.

BUNT.—Mr. McCabe initiated a discussion on this subject. The trouble had been much more prevalent during the past few years than formerly. It was stated that the soft wheats were more subject to the disease than other varieties Pickling with bluestone would destroy the spores and prevent them entering the wheat plant. Mr. W. Temby thought the dry seasons had something to do with the prevalence of bunt. Mr. A. Moody would like to know how it was that sometimes only one side of the ear was affected. Mr. R.

Butler, M.P., had tried various remedies and could not explain why they were not altogether successful. Mr. Marshman had more bunt in his crops during past two seasons than at any previous time, and was disposed to partly attribute this to the use of the seed drill. He strongly advocated a change of seed, and would advise getting seed from the South. Mr Churches had very satisfactory results from seed obtained from the North. With regard to the drill, he had used the old Brigham seed-sower, with similar action to the present drills, without having any ill effect. Mr. Moody showed illustration of tank for pickling wheat. A box is made 42in. long, 24in. wide, and 24in. deep. On one side two rings are affixed by staples about 20in. apart and 6in. from the top edge. On the other side of the box a windlass is fixed with two ropes about 20in. apart. The other ends of the ropes are fixed to the rings on the other side of the box. The box is filled with bluestone solution to within 8in. of the top. The bights of the ropes lie across the surface of the solution, and the bag containing the seed wheat is laid on the ropes. The handle of the windlass is prevented in revolving by means of a bolt let through the post supporting it, and by drawing this bolt back the ropes are slackened, so that the bag becomes immersed in the solution. After remaining half a minute immersed, a reverse turn or two of the windlass brings the bag again to the surface, and by continuing the turns it can be thrown over the opposite side on to a plank floor. It is claimed that a man can pickle twenty bags during one evening without assistance.

Mount Gambier, March 10.

Present—Messrs. J. Watson (in chair), J. C. Ruwoldt, A. J. Wedd, D. Norman, sen., T. Edwards, W. Barrows, J. Dyke, W. Mitchell, M. C. Wilson, and E. Lewis (Hon. Sec.).

BOTFLY.—A short discussion took place on question as to whether it was the botfly or the gadfly that attacked horses. The Hon. Secretary and Mr. Wilson quoted authorities to prove that the botfly was the one that attacked cattle, and the gadfly the one infesting horses, mules, and donkeys. Mr. J. G. O. Tepper, of the Adelaide Museum, in his article on the subject pointed out that the botfly laid its eggs in the skin of cattle, and the larvæ infesting the stomach of the horse was the gadfly. Mr. Wedd said the scientific men in Victoria called the pest affecting horses botfly. The Hon. Secretary said he had sent to Adelaide for identification a peculiar larva, like a maggot with a long sting-like tail, which Mr. Tepper stated to be the larva of the tanfly, an insect similar in appearance to the ordinary bee.

RAILWAY CARRIAGE OF PRODUCE.—Considerable discussion took place on the question of rail freight on produce sent to Adelaide from the South-East, and the efforts being made to secure a reduction in freight to and from Adelaide. Owing to the high charges the trucks came back from Adelaide practically empty, tradespeople obtaining their supplies per steamer. It was finally decided to unite with various kindred organisations in asking for a substantial reduction in railway charges.

STOCK INSPECTOR WILLIAMS.—A resolution was carried expressing the appreciation of the members of the efficient, courteous, and painstaking manner in which Mr. Williams carried out his duties as Inspector of Stock for the South-Eastern district.

CODLIN MOTH.—Some discussion took place on the codlin moth, and the steps taken to deal with the pest round Mount Gambier.

SHOW OF PRODUCE.—On the suggestion of Mr. Wedd it was decided to approach the local Agricultural Society with a view to holding a combined show of the produce of the district in April. Mr. Wedd tabled about fifty varieties of apples.

Auburn, March 15.

Present—Messrs. G. R. Lambert (Chairman), P. Cornwall, J. E. Isaacson, E. M. Dudley, W. F. Keynes, O. C. H. Lambert, J. Hean, W. R. Klau, and Dr. Yeatman (Hon Sec.).

EXPERIMENTS.—Various seeds were distributed for experiment. The Chairman stated that he grew the Hungarian Brome grass some years back, but it died out the following summer.

Stockport, March 13.

Present—Messrs. G. Burdon (Chairman), D. G. Stribling, C. W. Smith, J. Smith, J. F. Godfree, S. Smith, G. Thomas, S. Rogers, T. Megaw, F. Watts, T. Howard, P. Hogan, and J. Murray (Hon. Sec.).

DAIRYING.—The offer by the department to lend the Branch a pure-bred Jersey bull was accepted and arrangements made for his keep. It was decided that the fee for service be 2s. to members and 3s. to non-members.

STANDARD SAMPLE OF WHEAT.—Mr. C. W. Smith read a paper on "The Present System of Collecting Samples of Wheat," to the following effect:—

Under the present system the corn trade section of the Chamber of Commerce ask the Branches of the Bureau and wheatbuyers to forward samples of the season's wheat which has been purchased without deduction. These samples are mixed, measured, and weighed, and the standard for the season thus fixed. Now, how were these samples taken? The Hon. Secretary of the Branch goes to the local railway yard and takes a sample from one lot of wheat. There may be several different lots in the yard, but only one is sampled. How could this be a fair sample of the wheat of the district? It might happen that he samples the dirtiest or poorest lot in the yard. When nearly every farmer grows three or four varieties of wheat, a fair sample can only be obtained by taking a number of samples of each variety and mixing them. It is stated that it is absolutely necessary to fix a standard in order that whole cargoes of wheat may be sold prior to arrival in England or elsewhere, but the Farmers' Union ships wheat, and we never hear of them fixing a standard. Did the corn trade section obtain samples of the 345,000 bags of the present season's growth belonging to the Union? He contended that if the samples had been obtained properly, instead of weighing 63lbs. per bushel our wheat would average considerably heavier. The colony was losing thousands of pounds by the low standard adopted, and he saw no way of altering the present system except by refusing to collect and forward the samples asked for. South Australia's reputation for producing the finest wheat is being lost because there is no inducement to produce a first-class sample. As long as the wheat reaches the standard fixed the farmer gets top price, so why should he go to the trouble and expense of cleaning it thoroughly and producing a heavier sample? If the farmer were paid, say, 1d. per bushel more for extra quality wheat, it would pay him to put the sample through the winnower twice. Four men could put through 125 bags a day at a cost of say £1, while the extra 1d. per bushel would represent £2 1s. 8d.

[It would be interesting to know how the various samples are taken by our Hon. Secretaries. I feel sure Mr. Smith's idea is not correct as far as it concerns most of them. In regard to necessity for fixing a standard for the season, this is admitted by everyone who knows the conditions under which our wheat is sold. The Farmers' Union may send wheat home to a known purchaser without adopting a standard, but they could not send cargoes for sale to arrive under such conditions without leading to complications and loss sooner or later.—GEN. SEC.] Considerable discussion ensued, and it was agreed that the present system of obtaining samples was unfair.

Cradock, March 10.

Present—Messrs. R. Ruddock (Chairman), J. Paterson, J. Turner, J. H. Iredell, W. Haggerty, R. Solly, P. O'Dea, W. Symons, B. Garnet, J. H. Lindo (Hon. Sec.), and two visitors.

Pickling Wheat.—Mr. Paterson reported on proceedings of Quorn Conference and referred to discussion on pickling seed wheat. He considered it a mistake to pickle in the bags; the wheat should be put in the receptacle containing the pickle, or be pickled on the floor. Mr. Garnet said no system of pickling would destroy the spores in the unbroken bunt balls, but the bluestone pickle left a coating of poison on the seed which would kill any spores from the broken balls, which may come in contact with it. Mr. Turner considered pickling useless to prevent bunt, but Mr. T. Burt (visitor) said if wheat were pickled properly even several months prior to sowing it would not be affected. Mr. Iredell thought some land more liable than other to produce smutty crops. If he had dirty seed he would clean the wheat well by using very open screens, and blowing hard, so that nothing but heavy plump grain was left. Mr. Symons had adopted a system given some time ago in the *Journal of Agriculture*, and considered it far superior to that illustrated in the March issue. In the cask of pickle he placed a bag with bottom cut out, but tied up; at the mouth he attached a hoop fastened to a pulley and had a sieve attached to the hoop. He immersed the whole in the pickle and poured in the wheat through the sieve; all the white head, oats, bunt balls, light shrivelled grain, and other rubbish floated and was easily skimmed off with a tin with perforated bottom. The bag was then raised by means of the pulley, the bottom untied, and the wheat run into another bag.

Solid Straw Wheats.—The chairman said he found that horses did not like the cocky chaff from solid straw wheats. Mr. Iredell said there were now so many wheats cultivated that it was difficult to get pure seed of any particular kind.

Mannum, March 16.

Present—Messrs. J. G. Preiss (Chairman), A. Faehrmann, J. L. Scott, R. P. Scott, J. W. Walker, Henry Brown (Hon. Sec.), and visitors.

Stock Complaints.—Mr. Faehrmann reported that one of his draught horses had suffered for a long time from a large swelling in one of its hind legs. Occasionally the swelling burst and discharged a watery fluid, healing up again when the discharge ceases. He had tried various remedies without effect, but the horse did not appear to suffer any pain, nor did the swelling interfere with its working.

Change of Seed.—A visitor asked whether it was advisable to change seed wheat from the damp soils of the hills for the dry flats or *vice versâ*, also whether seed wheat two years old could be safely sown without pickling.

Sand-drift.—The Chairman called attention to the large area of land in the district rendered practically useless by the drifting sand. He stated that sowing oats, rye, or barley together, with a little super. would stop the drift.

Pyap, March 14.

Present—Messrs. J. Bowes (Chairman), W. Axon, C. Billett, A. J. Brocklehurst, J. Harrington, H. Mills, J. Arnold, J. F. Bankhead, and W. C. Rodgers (Hon. Sec.).

Rabbit-poisoning.—Mr. Arnold said his method of preparing poison for rabbits was as follows:—Take ⅓oz. strychnine and ¼oz. arsenic, mix dry and dampen with acetic acid; add at once half a pint of water as the acid if left seems to weaken the poisons. In another vessel put three cups water, and three of sugar, stirring well until the sugar is dissolved; stir the poison to a cream, then add it to the sugar and water; mix well and stiffen with pollard. To lay the baits, drag a log for about 50yds., lay the baits—about the size of pigeon's egg—on broad leaves of mallee in this furrow. In one case, where thirty-four baits were placed at intervals in a line of 50yds., 173 rabbits were found dead next morning.

Bute, March 13.

Present—Messrs. W. H. Sharman (Chairman), A. Schroeter, H. Schroeter, R. Commons, W. S. Sluggett, D. Green, W. Hamdorf, M. Stevens, A. Sharman, and M. Hall (Hon. Sec.).

MEMBERSHIP.—It was decided that the rule *re* attendance of members be enforced, and any members absent from three consecutive meetings be struck off the roll.

PICKLING OATS.—A discussion ensued on the pickling of seed oats, the majority being of opinion that pickling was advisable. Mr Sluggett said one ball of smut in a bag of seed might spoil the whole lot. Mr. Sharman sowed "smutty" seed wheat last season, but his crop was not affected. Most of the members thought the prevalence of bunt depended to a large extent on the condition of the ground at seed time.

Onetree Hill, March 16.

Present—Messrs. J. Bowman (Chairman), F. Barritt, H. H. Blackham, F. Bowman, F. L. Ifould, W. Kelly, A. Thomas, and J. Clucas (Hon. Sec.).

JOHNSON GRASS.—Members stated they found their stock not partial to Johnson grass, but it was a splendid stand-by. It should be fed young and well eaten down. Mr. Barritt sowed the seed with maize, but his stock would not touch it as long as there was any maize left. It was hardy and prolific if the ground were thoroughly well worked, but where cultivation was neglected it would die out.

USEFUL BIRDS.—Members corroborated statements made at previous meeting as to the usefulness of the Murray Jack or Butcher birds. They kept all sparrows at a distance.

RABBIT PESTS.—Rabbits are still troublesome, though the energy with which the farmers of the district have responded to the mandate of the local council to destroy them has already had satisfactory results. Cyanide of potassium sweetened with sugar is eagerly taken, but care must be taken to place it at considerable distance from the water supply. One member has had his young pine trees eaten to the ground, and another's melon crop has suffered, especially the water melons. In distributing phosphorised pollard, the Planet Junior used with one tine only had been found very serviceable, the furrows being expeditiously made and the poison distributed at intervals. It was agreed that the campaign against the rabbits must be vigorous, continuous, and general to be effective, as the scrub country furnishes a breeding-ground comparatively safe from attack; the district was kept supplied with rabbits from the Murray Flats. Closing up the holes and injecting fumes of bisulphide of carbon by means of indiarubber tubes was said to be effectual in dealing with rabbits in the burrows.

PICKLING SEED WHEAT.—A member stated that he found the plan of suspending the bluestone in a bran bag submerged in a barrel of water the quickest and best way of preparing pickle. Mr. Kelly said lime and salt made a good pickle, but it was difficult to get seed so treated through the drill.

SEEDING.—For successful cropping generous seeding was considered essential. Some wheats, bearded, for instance, require heavier seeding than others.

SHEEP ON STUBBLE.—Mr. Barritt reported that his sheep had done well on stubble alone for quite two months. [It would have been interesting to know whether the paddock had been manured or not the previous season.—GEN. SEC.]

CO-OPERATION.—Mr. F. Bowman gave an address on co-operation in connection with farming and pastoral pursuits, quoting published data showing where savings could be effected, especially in the sale of various commodities. He strongly supported the South Australian Farmers' Co-operative Union.

Mount Remarkable, March 15.

Present—Messrs. A. Mitchell (Chairman), W. Lange, C. E. Jorgensen, T. P. Yates, T. S. Bishop, and T. H. Casley (Hon. Sec.).

OFFICERS.—Messrs. A Mitchell, C. E. Jorgensen, and T. H. Casley were re-elected Chairman, Vice-chairman, and Hon. Secretary respectively, and thanked for past services.

BLUESTONE.—It was decided to send samples of bluestone for analysis.

Wandearah, March 7.

Present—Messrs. G. Robertson (Chairman), L. Stanley, T. Joyce, A. J. Dennis, W. J. Fuller, W. Roberts, E. Jacobs, W. Halliday, and C. E. Birks (Hon. Sec.).

GLADSTONE CONFERENCE.—The Chairman gave an interesting *résumé* of the proceedings of this Conference.

STANDARD SAMPLE OF WHEAT.—Members considered the sealed sample of wheat from the Chamber of Commerce to be poor in quality, and it was resolved that in the opinion of the Branch wheat going above 63lbs. per bushel should be paid for at a proportionately higher price.

SALTBUSH.—The Chairman called attention to statement *re* growing saltbush at the Agricultural College, and it was decided to ask Professor Lowrie for the name of the variety he was growing, and also to obtain seed if possible.

Burra, March 9.

Present—Messrs. F. A. S. Field (Chairman), Thos. Sandland, W. Heinrich, F. Duldig, E. Goodridge, Jos. Flower, J. H. Rogers, and R. M. Harvey (Hon. Sec.).

FERTILISERS.—The following matters in connection with the use of fertilisers for wheat crops have been noted by members:—The straw and stubble from the fertilised crops were much better liked by stock than straw from crops unmanured. The grass and herbage were also much more vigorous in growth on stubble land that had been fertilised, the benefit in the grass being very pronounced the first year afterwards. It was the general opinion that the use of the drill and fertilisers had proved a great success in this district, and that they would be largely used in the future. Although last season's rainfall had been light, the average return for the district was about 8bush.; in some cases crops fertilised with superphosphate gave up to 25bush. per acre. At World's End Creek, where the wheat was broadcasted, the returns were exceedingly poor, but the rainfall was largely the cause of the failure, only about 5in. being recorded during the season. Grasshoppers and rabbits also contributed to the failure.

Star Thistle. Mr. Flower reported that this weed appeared to be dying out, probably owing to the dry seasons experienced of late.

Wool-classing.—It was decided to ask Mr. G. Jeffrey to give a public lecture on this subject at the Burra.

Cherry Gardens, March 13.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, C. Lewis, J. Lewis, G. Brumby, A. Broadbent, H. F. Broadbent, G. Hicks, J. Metcalf, J. Mackereth, and C. Ricks (Hon. Sec.).

Poultry Disease.—Mr. Brumby asked reason why chickens were deformed at time of hatching. Some members thought it due to weakness resulting from in-breeding.

Bush Fire.—Some discussion on general subjects took place, including the prevention of damage by bush fires. Mr. Jacobs suggested the formation of fire brigades in each district, with proper appliances for fighting bush fires. If taken in time many fires could be prevented from assuming large dimensions. Under the present absence of system much valuable time and labor was wasted, resulting in large loss of property. It was also suggested that under a proper system there would be no difficulty in burning strips of country at least a chain wide around their scrub land and certain dangerous places every autumn, to prevent fires from spreading.

Annual Show.—The annual show of the products of the district was held at Cherry Gardens on March 15th, and was a great success.

Yield of Peas.—In previous issue it was stated that Mr. Jacobs obtained a yield of 24bush. wheat per acre from worn-out land manured with 3cwts. Thomas phosphate. This should have been 24bush. of *peas*, not wheat, per acre.

Quorn, March 14.

Present—Messrs. R. Thompson (Chairman), F. Herde, G. Altmann, C. Patten, and A. F. Noll (Hon. Sec.).

Conference.—Matters in connection with the recent Conference were dealt with, and the Hon. Secretary was thanked for his services in making the Conference so successful.

Orroroo, March 9.

Present—Messrs. J. Moody (Chairman), S. Roberts, R. Coulter, jun., M. Oppermann, and T. H. P. Tapscott (Hon. Sec.).

Bunt.—Mr. Oppermann read a paper on "Pickling Seed Wheat." He said the question was, should the farmer or the ground be blamed for the prevalence of bunt, commonly called by the farmers "smut"? He believed the farmers themselves were to blame. He had tried the experiment several times, but always with the same result. Pickled seed produced a clean crop, while the other was smutty. He generally used 5ozs. bluestone to the bag of wheat, and found it quite sufficient for most wheats except Steinwedel, which was most subject to bunt, and required ¾lb. bluestone to the bag. There was not much fear of bunt when wheat was sown in dry ground, whether pickled or not, but it was always safest to pickle the seed. Mr. Roberts had been growing wheat for over thirty years, and by pickling properly had never been affected by bunt sufficiently to damage the sale of wheat. He believed some soils were more liable to produce bunted crops than others. Clay soils seemed worse than sandy or limestone country. Mr. Coulter and the Hon. Secretary both stated their experience was that pure bluestone was a preventive of bunt. The latter generally used 4ozs. bluestone to the bag, pickling in the following manner:—Pound the bluestone fine, dissolve in boiling water in a jar or small cask, then empty the pickle into a larger cask holding 12galls. to 15galls. of water. This is enough for six bags of wheat. Empty the wheat on to a concrete floor, sprinkle it with pickle, aud turn it over several times.

Yoking Team of Horses.—The Hon. Secretary wished to know the best way to yoke a team of six horses to a plough or scarifier to prevent the animals getting sore shoulders—either abreast or in twos or threes.

Morgan, March 10.

Present—Messrs. R. Windebank (Chairman), H. Hahn, G. Roediger, J. Bruhn, and J. Wishart (Hon. Sec.).

Pickling Wheat.—A discussion on this subject took place, Professor Lowrie's recommendations being dealt with. The practice of those present has been to sow unpickled seed in dry ground, and to pickle on the floor with bluestone pickle after the land becomes fairly wet, and during past seventeen or eighteen years the crop has only once been reduced in value by bunt when this practice has been adopted.

Clare, March 9.

Present—Messrs. J. Christison (Chairman), W. Kelly, H. Carter, J. Treleaven, J. T. Hague, and J. H. Yelland (Hon. Sec.).

Use for Stinkwort.—Members suggested that stinkwort tied round the stems of young fruit trees would prevent damage by hares, and also protect it from the sun and thus prevent the stem becoming "hide-bound." It was noticed that with low stems the bark does not get bound, owing to the protection afforded by the branches.

Nantawarra, March 12.

Present—Messrs. E. J. Herbert (Chairman), C. Belling, R. Uppill, Jas. Nicholls, A. F. Herbert, A. L. Greenshields, and T. Dixon (Hon. Sec.).

Standard Sample of Wheat.—Members reported that a sample of past season's wheat was forwarded to the Chamber of Commerce, but the usual sealed standard sample was not returned. [Simply an oversight. The Chamber of Commerce returns a sealed standard sample to all Branches which comply with the request of the Chamber for sample—Gen. Sec.] Members wished to know how wheat was sold in England.

Water for Stock.—Mr. Belling said stock seemed to do much better on spring water this year than on dam water. He noticed the stock in the hills were looking much healthier and in better condition than in this neighborhood, and attributed it to the water. Could anything be added to their reservoir water to improve it? Horses that had access to the Whitwarta preferred it to dam water. Members thought good spring water would naturally be better for stock as, after a long spell of dry weather, the water in the dams was not so good and fresh as when frequent showers fell. Stock running in the hills, as around Clare and similar districts, would, on acount of the better rainfall, get more opportunities of a bite of green feed, which would greatly tend to keep them in good order. Members would like the opinion of other branches on the point referred to by Mr. Belling.

Naracoorte, March 10.

Present—Messrs. S. Schinckel (Chairman), D. McInnes, H. Buck, O. Hunt, G. Wardle, H. Smith, B. Roach, J. D. Smith, and G. Greenham (Hon. Sec.).

Manures.—Some discussion arose on circular *re* Peruvian guano. Mr. Smith said they could get English super. at less than £5 per ton, while this guano was £11. Members considered it too costly for use.

Stock Complaints.—Several members reported loss of cattle from impaction. Mr. Wardle had several affected, but cured them by giving boiled linseed oil as a drench two or three times a day; he also gave them a gruel of bran. Mr. J. D. Smith said he lost several cows from this trouble a few years ago, but since he had been feeding ensilage during the summer he had never had a cow affected. Mr. O. Hunt thought they should occasionally give their cows a laxative; sulphate of iron in the water was also good. He did not think the dry feed alone was the cause of impaction. Mr. Wardle said he had had a number of ducks attacked by some disease of the legs. At first he gave them sulphur mixed with bran or pollard without effect, but a dose of castor-oil and water with a little sulphur cured them. Mr. Hunt recommended putting a little sulphate of iron in the drinking water. Mr. Wardle called attention to statement in Victorian paper that the Chief Inspector of Stock had clearly traced the death of some cows to phosphorus poisoning, due to their eating poisoned rabbits.

Straw and Molasses for Stock.—Mr. Buck asked for experience of members in the use of straw and molasses for cattle feed. One person who sprinkled his stacks with molasses had them spoil; he used cocky chaff damped with 1pt. molasses in 4galls. water, but the cattle did not seem to take to it. Mr. J. D. Smith mixed the molasses much stronger; cattle take some time to get a taste for the mixture, but they soon become eager for it. Sulphate of iron could be added with advantage to the straw when stacking. Mr. Wardle advised damping the straw with salt and water when building it. The Chairman called attention to paper on heading the wheat crop to provide straw, by Mr. H. B. Moody, of Mallala Branch, and some discussion followed.

Early Greenfeed.—The Chairman strongly advised the harrowing of land that had been under crop just before the autumn rains, so as to get a good crop of grass. He had tried this plan with good results. He had also harrowed barley in early on land cropped the previous year and got good returns.

Kanmantoo, March 16.

Present—Messrs. Thos. Hair (Chairman), E. Downing, Thos. Hawthorne, P. Lewis, J. T. Hair, and F. Lehmann.

Grasses.—Mr. W. J. Mills forwarded paper on "Some Notes on Natural Grasses of South Australia," which caused considerable discussion Members agreed that stocking lightly and occasionally spelling the paddocks were the best means of preserving the valuable native grasses and was the most profitable in the long run to the owner. Mr. Downing said sheep would eat out and kill the succulent grasses much quicker than other stock, as they bite deeper into the centre of the plant. He had known "rib-grass" to be eaten out and killed in one year by sheep.

Eaglehawks.—Mr. Thomas Hair asked best means of destroying eaglehawks, which were attacking the young lambs. Mr. Downing suggested trapping with rabbit-traps placed round a bait, or poisoning with strychnine placed in freshly-killed rabbits or sheep. Wild dogs had been known to take poison in kippered herring after it had been dragged about to attract them by its scent.

Forest Range, March 15.

Present—Messrs. J. Sharpe (Chairman), J. S. Rogers, A. Green, J. Green, W Cherryman, H. Waters, J. Caldwell (Hon. Sec.), and five visitors.

How to form a Garden in Heavily Timbered Country.—Mr. Waters read a paper, of which the following is an abstract:—

> After clearing off the timber that is in the way, it is necessary to select the positions to be devoted to the different classes of fruits, for it would never do to plant raspberries where black currants would thrive, nor cherries where apples would do best. If there is no market for the timber, the best thing is to burn it. The next thing will be to make drains to carry off the surplus water. If it is not possible to trench the whole of the land in time, strips 4ft. wide and 18in. deep may be dug, and trees can be planted the first year; but the sooner the spaces between are broken up the better will it be for the trees. Selection of trees is a most important matter. Buy none but the best, as it will be found that a good sort grows just as easily as a bad one. Do not grow too many varieties, and keep the different sorts separate. [Do not plant extensive blocks of one variety, as it is necessary in many cases to receive fertilisation from another variety.—Gen. Sec.] If the whole of the ground is broken up, gooseberries and strawberries may be planted between the rows of trees. Apple trees should be planted 18ft. apart each way. This will allow of two rows of gooseberries 6ft. apart between the trees and one row of strawberries between each row. In three or four years the strawberries will run out, and in three or four years more the gooseberries will be finished, by which time the apple trees will have come into bearing. In regard to the timber, do not be too indiscriminate or rash in destroying it, else much harm may be done. Wind, frost, heat, cold, shade, &c., are no mean things to contend against. Only kill the timber where the garden is to be established, as what is left will make a good windbreak and shelter. Dead trees are more easily grubbed out than living trees. All rubbish and timber should be burned during summer, and break up the land during winter. Plough the land 15in. deep at least, with the help of a strong bullock team. It is important to run out the best line of road before trenching and ploughing the land. It should be located in the most convenient place to save heavy pulling, and so that produce can be easily loaded, or manures, &c., unloaded, without having to carry either too far for the purpose. Of course the positions of the stables, packing sheds, and other erections should be located with due regard to the same considerations.

Mr. A. Green thought different kinds of fruit trees required to be planted at varying distances apart. Mr. Rogers had found the grubbing machine a great help in clearing ground, and had found a rope made of several strands of fencing wire acted splendidly. Mr. Sharpe thought that, with proper care, there was little danger of fire getting away when burning rubbish, &c., in summer. There was no necessity to plough deeper than 12in. Ploughing was quicker; but the pick and shovel did better work, as levelling could be done at the same time. He considered anything less than 20ft. apart too close to plant fruit trees, and then they would interlace. He did not favor the Tasmanian system of low training, as the fruit is better colored on open trees. He would not advise to plant cherries until the locality has been proved to be suitable for them. An acre of heavily-timbered land could not be cleared, trenched, and planted for less than £40. Mr. Green thought that the growing of berries between the rows of trees would retard progress, and doubted whether it would pay. Mr. Sharpe would not plant raspberries between the rows, but would grow strawberries, as they pay well and thrive on new ground. Mr. Waters said the growth of trees is very greatly checked by raspberries or rhubarb. Nothing should be planted close to the trees; but, where the soil is rich, a few rows may be planted to keep the gardener going until his trees begin to bear. Mr. Rogers preferred to break up the whole of the ground at once. He had planted in holes 4ft. square, afterwards breaking the whole, but found that the trees did not do nearly so well as those planted where the whole of the land was broken up. Water could not collect in the holes and injure the roots, as the land was on a steep siding. Mr. Sharpe thought shelter trees should be at least 15yds. to 20yds. distant from the fruit tree, and a trench 3ft. deep should be dug to cut the roots Some members recommended that the early planting should be in May, and late in August or in September for the late planting.

Exhibits.—Mr. Caldwell tabled a water-melon, mammoth pumpkin, and potatoes; all considered worthy of further trial.

Lyndoch, March 15.

Present—Messrs. H. Kennedy (Chairman), W. Rushall, jun., W. J. Lawes, W. McIntyre, W. J. Springbett, and J. Mitchell (Hon. Sec.).

Best Wheats for District.—After much discussion it was decided that the best three wheats for this locality, with regard to prolongation of harvest, were White Tuscan, for hay, but not for grain; Victorian Purple Straw for all-round purposes; Marshall's No. 3, although somewhat slow, is preferable to Purple Straw in a rusty season.

Koolunga, March 15.

Present—Messrs. T. B. Butcher (Chairman), R. H. Buchanan, J. Sandow, W. J. Jose, J. Butterfield, J. Button, and G. Pennyfield (Hon. Sec.).

Bluestone.—Members were gratified with the action of Central Bureau in receiving samples of bluestone from various centres of farming and having them analysed. The sample sent from this locality showed 63·2 per cent. sulphate of copper, equivalent to 98·9 of crystallised sulphate of copper.

Johnsburg, March 10.

Present—Messrs. F W. Hombsch (Chairman), L. Chalmers, F. W. Smith, J. R. Masters, J. Sparks, P. Caughlan, M. L. Read, G. H. Nunn, and T. Johnson (Hon. Sec.).

Quorn Conference.—Messrs. Homsch and Nunn paid a high tribute of praise to the organisers of the Conference of Northern Branches at Quorn, but regretted that only two sessions were held, as there was not sufficient time allowed for discussions.

Pickling Wheat.—Mr. L. Read read the following paper:—

Having during the last four years watched very closely the effect of pickling wheat as a preventive of bunt, I am convinced that to receive the full benefit of pickling it is necessary to pickle at least a month before sowing, to allow the wheat to thoroughly dry, and to give the bluestone time to kill the germ of the smut before the wheat is sown; for I believe that sowing wheat before it is thoroughly dry causes bunt rather than prevents it, for I have never seen bunt in wheat that has been allowed to stand a month after pickling before sowing, even though the crops around it were badly affected. Three years ago two farmers adjoining me bought wheat out of the same stack, and sowed it at the same time under exactly the same conditions, only that one farmer pickled a month before sowing while the other only a few days, with the result that when harvest time came the crop where the seed was pickled some time before sowing was perfectly free from smut, while the crop that was only pickled a few days before sowing was very badly affected As Steinwedel seems much inclined to smut, it needs pickling much oftener. I have been growing Steinwedel since 1891, and I have always pickled with the exception of one year, in 1898. I did not then pickle, and what I grew that year was fully one-third smut. Now several said if I sowed smutty wheat I would grow smut, but I pickled it six weeks before sowing, with the result that I grew a crop perfectly free from it.

There was a difference of opinion as to whether or not bluestone solution is a preventive of bunt in seed wheat. The great majority agreed that it is beneficial to pickle the seed some time before sowing, also that the seed should be placed in clean bags after being pickled. Bluestone somewhat checks the germination of the grain, and there is much less liability to bunt when the seed is sown in dry soil before rain has fallen. A question was asked if green grains amongst the seed caused bunt. [No; the spores or seeds of bunt are the cause of fresh bunt plants—that is, bunt is grown from seed, just as wheat is produced from seed.—GEN. SEC.]. Another member wished to know whether the solution of bluestone is weakened when wheat or other grain has been immersed in it. [No, again; the "pickle" is just as strong as at first.—GEN. SEC.].

BONES UNDER FRUIT TREES.—Question asked, should bones be placed beneath newly-planted trees, or would it be better to place them in the ground a few feet away? [Break them as small as possible and mix them with the soil around the tree at a depth of 8in. to 12in.—GEN. SEC.]

Port Germein, March 17.

Present—Messrs. Geo. Stone (Chairman), W. Mortess, D. Thomson, W. Head, W. Broadbear, A. Thomson, E. McHugh, W. Crittenden, E. J. Blesing, A. H. Thomas (Hon. Sec.), and two visitors.

PICKLING WHEAT.—The Chairman said he had not pickled any seed wheat for fourteen years, and had never been more free from bunt. He considered pickling unnecessary in this locality. Mr. Crittenden was of the opinion that seed wheat should not be sown without being pickled if the weather is close, muggy, or showery. If this were neglected, as he had proved by experience, bunt would be produced. Mr. Head said he had lost severely this season from bunt. He believed the seed drills added to the prevalence of bunt by crushing the unbroken bunt balls, and thus infecting the machine and all grain that passes through. The whole of his crops were drilled in, and he had never before had so bunted a crop.

EXHIBIT.—Mr. Blesing tabled splendid samples of Five-Crown (London) Pippin and Jonathan apples, and Italian Yellow peaches.

Maitland, March 3.

Present—Messrs H. R Wundersitz (Chairman), A. Jarrett, W. Wilson, H. Bawden, C. F. G. Heinrich, J. Hill, J. Kelly, J. Smith, and C. W Wood (Hon. Sec.).

EUCALYPT TREES.—Mr. Bawden said seeds of eucalypts should be sown during March and covered very thinly. They should be planted out during July in this locality, as August is too late. The Hon. Secretary said he had achieved the greatest successes when he had sown the seeds where the trees were wanted to grow. Mr. Jarrett said that sowing in the open is of no use, because of weeds. [Would it be possible to keep the weeds under by hand-picking or use of the hoe?—GEN. SEC.]

BUNT.—Mr. Wilson read a paper on "Bunt." In discussion, Mr. Heinrich advocated use of clean seed combined with thorough pickling. Mr. Jarrett only made enough pickle to do for 8bush. at a time, as he thought the spores washed off in the pickle drained back into the tank. He preferred perfectly fresh lime to bluestone. Mr. Smith had been more successful with lime than with bluestone. He advocated cleaning by blowing and floating the seed, then pickling.

SORGHUM.—Mr. Jarrett tabled specimen of sorghum 5ft. high, grown without watering. He manured and ploughed the land early in winter, kept it well worked, and sowed the seed in September. The Hon. Secretary said the end of August was the best time to sow sorghums in Kilkerran.

Arthurton, March 15.

Present—Messrs. B. Short (Chairman), M. Baldock, J. W. Packer, H. Baldock, and J. B. Rowe (Hon Sec.).

STANDARD SAMPLE.—Members consider it is quite time that something should be done to bring about a more satisfactory arrangement with regard to the standard of fair average quality of each season's wheat sent to England.

RAINFALL.—At Winulta, February, 0·11in.; March, to date, 1·65in.

Wilson, March 17.

Present—Messrs. W. H. Neal (Chairman), R. Rowe, T. Matthews, H. Ward, H. Need, T. Barnes, H. T. Crossman, and A. Canning (Hon. Sec.)

STANDARD SAMPLE.—All members were agreed in the opinion that the sample of wheat sent up by the Chamber of Commerce is quite equal to the average grown in the district this season.

BEST PAYING ANIMAL.—After much discussion a vote was taken, when three members favored horses, and two each pigs and cattle.

MANURING.—It was resolved that the experiments to be conducted by the Hon. Secretary this season will be sufficient.

Gumeracha, March 19.

Present—Messrs. D. Hanna (Chairman), A. E. Lee, W. Jamieson, J. Monfries, W. Cornish, W. A. Lee (acting Hon. Sec.), and two visitors.

STANDARD SAMPLE OF WHEAT.—This Branch considers the 1899-1900 sample sent out by the Chamber of Commerce inferior, and likely to injuriously affect the colony in the wheat markets of the world. Members favor the adoption of Professor Lowrie's suggestion to have two grades, which would give some inducement to farmers to clean their wheat better than is done at present.

Mundoora, March 19.

Present—Messrs. W. D. Tonkin (in chair) W. D. Shearer, H. T. Torr, C. Button, H. Haines, D. Smith, W. H. Mitchell, W. Aitchison, T. Watt, J. Loveridge, D. Owens, and A. E. Gardiner (Hon. Sec.).

BRANCH SHOWS.—After considerable discussion it was resolved that the members consider it unwise to extend the united Branch show of produce and industrial work to include horses, cattle, &c., as proposed by Port Broughton Branch, but would favor holding the usual combined show and field trial similar to that held in 1894.

OFFICERS —Messrs. R. Harris and A. E. Gardiner were re-elected Chairman and Hon. Secretary for ensuing year; Mr. W. Aitchison was elected Vice-chairman. A vote of thanks was accorded to the retiring officers, also to the General Secretary for his promptness and courtesy in dealing with matters referred to him.

Rainfall.—Mr. Tonkin reported rainfall for 1899 10·56in., of which 8·7in. fell between April 1st and December 1st. With this low rainfall a first-class sample of grain could hardly be expected.

Port Broughton, March 12.

Present—Messrs. W. R. Whittaker (Chairman), E. Dalby, E. Dennis, W. Tonkin, and Jas. Barclay (Hon. Sec.).

Standard Sample of Wheat.—Some discussion took place on the standard sample of wheat for season 1899-1900. Members generally thought the sample sent out by the Chamber of Commerce was very fair considering the severity of the season.

Belair, March 16.

Present—Messrs. O. Nootnagel (Chairman), C. Downer, H. Halstead, J. Halstead, W. J. Bartlett, and G. R. Laffer (Hon. Sec.).

Exhibit.—The Chairman tabled Chinese marrow, from Bureau seed; also peaches for identification. Mr. Bartlett tabled several varieties of peaches, which were much admired. The Hon. Secretary reported having attended the Cherry Gardens Show, which he considered very creditable to the district.

Honey for Export.—The Chairman read paper on this subject, which it was decided to forward for the Strathalbyn Conference.

Holder, February 17.

Present—Messrs. F. A. Grant (Chairman), F. G. Rogers, J. Rossiter, J. Maddocks, E. Crocker, J. E. Trimming, J. Rowe, H. Blizard, J. Green, W. Watt, E. Jaensche, F. Slater, John J. Odgers (Hon. Sec.), and two visitors.

Exhibits.—Mr. Blizard tabled Turkish Giant sweet melon—a very prolific bearer and large plant; King Humbert tomato, oval, yellow. Mr. Slater said Helios tomato seed seemed to be much mixed with yellow, red, smooth, and wrinkled. The Melrose sweet melon was very prolific; small, but of nice flavor.

Balaklava, March 10.

Present—Messrs. G. Reid (in chair), C. L. Reuter, W. H. Sires, A. Manley, A. W. Robinson, W. H. Thompson, W. Smith, A. Hillebrand, and E. M. Sage (Hon. Sec).

Sheep Complaint.—Mr. Robinson reported having lost twenty-eight good Merino ewes from impaction; he saved as many more by the following treatment:—Give half a pint of linseed oil twice in one day; then give about two pints linseed tea daily until cured. To make the linseed tea boil a pint of linseed in a kerosine tin full of water for six hours. He considered the trouble due to the sheep feeding too long on the stubbles; they first eat up the flag and the weeds, and then have nothing but hard dry straw to feed on. The Merino was far more difficult to treat than the crossbred, being wilder to handle. The crossbred seemed to have more pluck than the Merino, as when the latter gets bad it caves in at once.

Bunt.—A discussion on this subject took place. Mr. Manley thought that the frost was the cause of bunt. The Hon. Secretary had his wheat badly frosted, but no bunt was present. During the past two seasons he had used rainwater in making his pickle, and his crops were quite clean. In previous years he used well water and always had more or less bunt in the crops. Mr. Robinson also used rainwater in making the pickle, and had no bunt except in the last paddock sown, which was both "smutty" and frosted. Members did not agree with Mr. Manley's idea, but thought there was something very erratic about the propagation of bunt, as sometimes a crop from pickled seed will be dirtier than unpickled sown alongside.

Holder, March 10.

Present—Messrs. J. Rowe (Chairman), H. Perry, H. Vaughan, J. Green, E. Jaensche, J. Rossiter, F. Slater, W. Watt, F. G. Rogers, J. E. Trimming, and J. J. Rogers (Hon. Sec.).

SUBJECTS FOR DISCUSSION.—In the absence of papers or subjects for discussion, members were requested to study the *Journal of Agriculture*, and bring forward at each meeting any matter therein which they might think practical and interesting

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Elbow Hill, March 13.

Present—Messrs. H. T. Styles (Chairman), W. Ward, C. G. Ward, W. N. Beinke, E. Wake, F. G. Brooks, H. Dunn, W. Spence, W. Crook, G. Wheeler (Hon. Sec.), and five visitors.

FEEDING HORSES.—The Chairman referred to the practice of feeding horses on dry wheat. Mr. Brooks said a moderate quantity of dry wheat mixed with chaff was excellent for horses. He had used wheat for more than a year with best results. He uses 16galls. per day for eleven horses. Mr. Wake thought a less quantity would be enough. He did not like pollard for horses; the very best feed was oats. Mr. Beinke fed two jam tins full of dry wheat (about 4lbs.) with each feed for a horse, and they never throve better. Mr. Ward said that in Queensland they feed gram (Cicer arietinum) to horses, which did remarkably well.

LOCAL DISSATISFACTION.—Members discussed matters in connection with disposal of wheat and other produce and purchase of bags. Opinions were somewhat divided as to what should be done to remedy this state of things, but they were unanimous in their dissatisfaction with the way they had been treated by agents at Cowell this season.

Morphett Vale, February 7.

Present—Messrs. L. F. Christie (Chairman), J. Bain, H. Anderson, F. Hutchinson, A. Jones, J. Spriggs, J. Depledge, A. Pocock, and A. Ross Reid (Hon. Sec.)

MANGOLDS.—Mr. Pocock tabled mangolds of great size, and in answer to a question, said these roots should be pulled in February and stored for some time before being fed to cows.

DAIRY-FARMING.—Mr. Pocock read a paper to the following effect:—

The first question must be whether the farm is suitable for dairying, and can constant attention be devoted to feeding the cows, milking, and all the necessary details. There should be plenty of running water, so that the cows can drink whenever they wish to. The natural pasturage must be supplemented with a few acres of cultivated greenfeed and some hay. Sow rye and barley during April and May, mangolds in August, maize in September, and sorghum in October, November, and December; but the land must always be properly prepared. For rye and barley cart a lot of fresh horse manure on to the land early in March; plough and work down the soil as fine as possible, and let it remain until the rain comes. Sow and plough in the seed while the surface is wet, then harrow the land, but do not roll it. Land for mangolds should be heavily manured with well-rotted farmyard manure, ploughed under deeply, and kept well worked during winter. Sow the seed in August. Maize requires the same treatment as mangolds, but will do with less manure For sorghum the land must be well worked during spring, and the hogweed that will spring up must be destroyed before sowing the seed. Do not sow until after rain has fallen, even if it does not come until December. Planters' Friend is much liked by stock, and will afford cuttings as late as June, but it is rather slow in growth at first. [The essayist then described the characteristic points of a good dairy cow.—Ed.] The best cows should be selected from the herd and mated with a pure Jersey bull during June or July, so that they may come into full profit in March or April. Each cow should have its own bails and feed box. All food should be chaffed and fed to the cow before milking. Some copra cake or bran should be also given. The teats should be washed and wiped dry before milking. This will avoid sore teats and ensure clean milk.

Amyton, March 8.

Present—Messrs. H. Turner (chair), John Gray, James Gray, Wm. Mills, Wm. Gum, Wm. Hawke, Wm. Hughes, R. Brown, Thos. Gum, H. Gray, A. Thomas (Hon. Sec.), and one visitor.

Wheats Suitable for District.—Mr. Mills said in his experience Purple Straw is a fairly good wheat, but the earlier varieties had been better during the last three or four years. His best results had been obtained from Bartlett's crossbred; the next best was Sydney Purple Straw. The African bearded wheats were also good, but caused more labor in reaping and cleaning. Mr. H. Gray had grown Bartlett's crossbred for three years, and found it the best. This year it weighed 67½lbs. per bushel. Three members said Steinwedel had given them best results for a long series of years. With one exception all members spoke highly of Bartlett's crossbred. Mr. John Gray doubted if the wheat grown locally as Bartlett's crossbred for past three or four years was identical with that sent out by the Central Bureau. The Hon. Secretary said he had grown both side by side, and could not detect any difference, except that the locally grown wheat was mixed with dark-colored heads and some bearded. Mr. Mills said these dark and bearded varieties were "sports" or reversions, caused by the wheat having been distributed before the type was fixed. Several members considered Allora to be one of the best wheats. Mr. Wm. Gum spoke highly of King's Early. The majority of members favored Bartlett's Crossbred, Allora, and Steinwedel. Indian King reported to be poor, with very small ears.

Forster, January 16.

Present—Messrs. A. Johns (Chairman), J. Sears, C. Bolt, F. Towill, J. Johns, C. R. A. Schenscher, W. Johns, F. Johns, J. Retallack, J. A. E. Schenscher, A. G. Prosser (acting Hon. Sec.), and four visitors.

Experiments.—Mr. Retallack sowed 6ozs. Bartlett's Crossbred wheat, and reaped 14lbs.; 4lbs. Dart's Imperial gave 140lbs. Other members reported favorably on these wheats.

Sore Shoulders.—Mr. J. Retallack said he had been driving horses for more than thirty years, and never had one with sore shoulders. The way in which some people treated their horses was shocking for its cruelty. It is the owner's fault if his horses have sore shoulders; because, if the collar fits properly it cannot chafe or rub, and consequently the shoulders will not become sore.

Riverton, March 17.

Present—Messrs. H. A. Davis (Chairman), J. Kelly, T. Gravestock, W. Hannaford, M. Badman, H. A. Hussey (Hon. Sec.), and fifteen visitors, including Mr. Geo. Jeffrey, Government Wool Instructor.

Wool.—Mr. G. Jeffrey lectured on Wool, and, as a consequence it is expected that a class will soon be formed in Riverton.

Minlaton, March 17.

Present—Messrs. James McKenzie (Chairman), T. Brown, A. McKenzie, John Anderson, James Anderson, J D. Mayer, H. Boundy, W. Correll, James Martin, J. Bennett, J. Correll (Hon. Sec.), and one visitor.

Standard Bushel.—After much discussion, during which oft-repeated statements made at other meetings were reiterated, the following resolution was adopted:—"In the opinion of this Branch the members of each Branch of the Bureau should bring each year after harvest a fair average of their crop, properly cleaned, and that such samples should be forwarded to the Central Bureau to be mixed with the rest of samples from the other samples, and this ought to be taken as the fair average quality of our wheat for the season."

Papers.—Mr. J. D. Mayer read a paper on "Tree-planting on Farms," and Mr. W. Correll read the following paper on "The Seasons." There was no discussion on either paper.

Have the seasons changed during the last twenty years? Anyone who has been engaged in agricultural or pastoral pursuits during the last twenty years cannot but have noticed that the weather of the last few years is unlike the weather of twenty or even fifteen years ago. If he be an observer of the changes of the weather he will have noticed, besides dry seasons, that of late years there has been very little lightning and thunder, that the rains that have fallen have been patchy, and that there has been a difference in the prevailing winds of a season. I take a great interest in the changes of the atmosphere. In the early part of the year I have noticed during the last three years that the wind has blown very little from the south-east, but in years when the rainfall was good and general we had south-east winds for weeks at a time during February and March I notice that up to date of the present year we are getting more south-east winds, which I hope may be an indication of the return of better seasons. It is not easy to say just when good seasons ended and bad ones began, because the change extended over several years, and the rainfall became more patchy. Some seasons were good in the northern districts that were less favorable in the south, and *vice versa*. A table of the rainfall for the year does not show if the rainfall has been favorable for the growth of crops, as the rains may have been light when most wanted and heavier in the summer months.

Next to dry seasons perhaps the infrequency of thunderstorms is the most noticeable, but even thunderstorms did not cease suddenly, but gradually became less frequent, with what might be called dry thunderstorms at intervals. In these thunderstorms plenty of flash lightning passed from cloud to cloud, with little thunder or rain.

During the dry years I have noticed that there has seldom been more than two of the lower cloud currents to be seen where there used to be several in years gone by. I think this infrequency of the higher and lower wind currents bearing their different kind of cloud formation explains the reason for so little weather and the lightness of the rainfall. It is electricity that gives to clouds their form; the particles of moisture charged with like electricity have a tendency to keep apart, but when there are several strata of cloud moving over each other they become overcharged with the electric fluid, which will escape to the easiest point to restore equilibrium, be it the earth or some other cloud oppositely charged, the thunder being due to the resistance the electric fluid meets with in its passage through the atmosphere. This sudden release of electricity from the cloud causes the particles of moisture to unite, and rain to fall. Schemes have been mooted to draw off the electricity of the clouds.

Another atmospheric phenomena in the Aurora Australis, or Southern light, said to be due to the passage of electricity through the upper regions of the atmosphere, has not appeared very often of late years; it used to be followed by a good rain.

Anyone who has looked at the clouds with a view of forecasting rain will, I think, admit that the old weather signs did not work during the last year or two as they used to do; as when there was every appearance of a good rain, with the wind right and plenty of cloud, yet it would pass off with little rain. In the remarks of the Government Meteorologist it is often mentioned that the approaching storm has swerved off along the coastline and went south.

I think the absence of the upper currents of wind will explain in a great measure the cause of these storms not reaching far inland. Being shallow they are unable to overcome the land resistance, and these shallow storms coming one after another quickly may be the cause of calm weather and high barometers over Central Australia in April and May, when we expect good rains.

There have been signs during the last six months that there is a change of seasons at hand. A little of the upper cloud strata appeared occasionally. On the afternoon of March 13th there was evidence of no less than four distinct currents of wind, three from a westerly or north-westerly direction and one strong southerly current between the two upper westerly ones. A nice soaking rain set in in the evening.

Dry seasons are by no means confined to latter times. We read of years of famine in Scripture that did not come by chance We may all learn wisdom from the dry seasons, and I think most of us have learned some lessons, by the better conservation of water and feed for stock, by more fallow as a means of conserving moisture for a future crop, by better attention to the seed to be sown, by more frequent selection and changing of seed so as to get varieties best capable of withstanding dry seasons and disease, by growing other crops than wheat, and, by no means least, the keeping of sheep on the farm.

Dry seasons following each other have, I think, been the cause of some of our best lands not producing crops of grain or feed, not even with a good season. Owing to a want of moisture in the soil to enable the chemical changes to go on necessary to liberate plant food, this want of plant food, or some of its main constituents, naturally deficient in the soil have now to be added, and has brought into practice on Yorke's Peninsula, and has extended over a great portion of the colony, and has also extended into the sister colonies, a more scientific and systematic method of farming in the use of the seed and fertiliser drill.

Appila-Yarrowie, March 16.

Present—Messrs. J. Wilsden (Chairman), P. Lawson, A. Fox, N. Hannagan, J. H. Bottrall, W. C. Francis, W. Stacey, E. Catford, and C. G. F. Bauer (Hon. Sec.).

RESIGNATION.—Mr. J. M. Grant resigned his seat as a member on account of leaving the district. He joined the Branch in December, 1890, and has been a most active and intelligent worker for the Bureau.

SOWING CEREALS.—After a discussion upon seed drills and broadcast seed sowers, the concensus of opinion was in favor of the drills; although some of the members could not detect any difference in the crops sown with either implement.

Crystal Brook, March 17.

Present—Messrs. G. Davidson (Chairman), W. J. Venning, A. G. W. Hamlyn, J. C. Symons, G. Miell, and F. S. Keen (Hon. Sec.).

SALE OF WOOL.—The general opinion is that there is a difference of 2d. per pound in favor of Geelong as a market for wool.

CARE OF FARM STOCK.—Mr. G. Miell read a paper to the following effect:—

The horse is one of the most useful of animals; but about one-third of them die at an early age through bad treatment. They are often half-starved, over-loaded, and over-driven, and made to work with ill-fitting harness. If a horse is well fed and properly cared for, it is ready at any time to go to work, and if extra strength is needed for a pinch it is there for service; but the poor and ill-treated horse has neither life nor strength for a pull. A horse that is properly looked after will be capable for work at 20 years of age; but it is doubtful if an average of one in fifty can do a day's work at that age; most of them are worn out at the age of 10 or 12 years. With regard to cows, if they are well fed and cared for they return the attention with full quantities of rich milk. They do not put on much fat, but pay for their kind treatment through the medium of the pail. But there are not a few farmers who allow their cows and all other stock to shift for themselves, with no shelter from the inclemency of weather in winter or summer. Some people sell all their hay, and let their stock starve. Every farmer should save a good lot of straw and all his "cocky chaff" to provide against seasons of drought and scarcity. How often is to be seen a farm where the stock are all poor, the fences and yards broken down, pond muddy and used as a wallow by pigs, the water serving as drink for stock and human beings, dilapidated sheds, and even the house in which the family dwells all tumbling down and neglected. "The surroundings of a man in any condition of life, whether he be rich or poor, are in most cases an idex to his character, whether he has an eye for the beautiful or not. He may not be rich, but he may make the best of what he has got, and become better off by careful management and thrift."

Members are of opinion that oaten hay is best when cut in a ripe condition. Straw is made more palatable for stock when it has been sprinkled with salt and molasses in water, or with sugar in absence of molasses.

Port Pirie, March 17.

Present—Messrs. P. J. Spain (Chairman), T. Jose, T. Gambrell, W. K. Mallyon, T. Johns, W. Smith, H. B. Welch, E. J. Hector, and R. J. Kenny (Hon. Sec.).

CARRIAGE OF LIVE STOCK.—Mr. Hector said that the charge for conveying a live calf from Crystal Brook to Adelaide is 3s. 6d. In answer to a deputation, the General Traffic Manager of the railways wrote that he could not at present recommend the Railways Commissioner to specially fit up a truck with divisions for separate classes of stock until it can be shown in practice that the expense would be warranted. There would, however, be no difficulty whatever in bringing such animals to Adelaide on Tuesdays for Wednesday markets, provided a short notice is given of the number of each proposed to be sent. He could not recommend any reduction upon present tariff of charges.

PROTECTION OF WOODWORK.—Several members affirmed that if any wood is saturated with a solution of bluestone, the termites (or white ants) will not attack it.

Richman's Creek, March 19.

Present—Messrs. A. Knauerhase (in chair), J. M. Kelly, J. McSkimming, P. J. O'Donohue, J. J. Gebert, and J. McColl (Hon. Sec.).

VISIT SOUTHWARDS.—Mr. Knauerhase gave a lengthy report of a visit recently paid by himself southwards. The following are some of the most interesting items:—

On the journey down the grass and stubble near the line, with a few exceptions, appeared to be very short and light until Mintaro was reached, but from there southwards an improvement was noticeable. At several places in the North I noticed the tree plantations were looking sickly, and was informed that a girdling grub attacks the trees and eventually destroys them. Nearer Adelaide the plantations looked more healthy and flourishing. Going on to Murray Bridge I was agreeably surprised at the beautiful scenery on parts of Mount Lofty Range. To one from the dry and dusty North it is like coming into wonderland – flowers, vegetables, fruit gardens, and everything looked so green and fresh. At Murray Bridge I was introduced to Mr. Edward Jeansch by Mr. Wurm. Mr. Jaensch was very kind, and when informed that I was a member of a northern Branch was ready to give me all the information he could on farming matters in his district. The average return of wheat last year was 7bush., and the average rainfall 14in. They also have the rabbit pest to contend with. The settlers (mostly Germans) are getting on fairly well. Rents are from 1d. to 2d. per acre, but generally speaking the land is poor. They have taken to use the drills and artificial manures, otherwise they could not make a living. The returns after the drills and superphosphates was 15bush. per acre, while under the old system it was only from 5bush. to 6bush. In regard to the Adelaide Show, I thought the show a good one. Grapes, peaches, and potatoes were real good. There was wheat in the straw and grain in great variety. The main attraction to farmers in machinery appeared to be drills, separators, Alpha grinders, and harvesting machinery. Some seven or eight makes of drills were represented, and each appeared to have its admirers. A revolving screen for cleaning wheat, with brush attached, was on view, price £7 10s. I thought it a dear article considering the price of wheat. The Alpha grinder should be of service to farmers, as with it they could make their own flour, bran, and pollard. Harrold, Colton, & Co. had on view harrows, each leaf of which covered 5ft., price 45s. per leaf. I believe it is a good harrow, as the tines can be regulated backwards and forwards at will. An article that should prove useful in the house was a cool storage safe, for which it was claimed that it would keep things cool in the hottest weather. On my return journey I visited Freeling. Hay is mostly grown here, and the price at times was £2 7s. per ton for sheaves Many of the farmers only crop on fallow; they were drilling in English superhosphates at the time of my visit up to 2cwts. per acre, with the intention of broadcasting the seed in afterwards. I was told that wheat drilled in was more difficult to cut with the binder, as in crossing the drills the crop is bunchy. Complaints are also made that when the seed is drilled in with the manures and lies any length of time in the dry soil a good percentage is destroyed by the manure, which leaves the crop thin. There is some good farming in the southern districts; the fallows were very free from weeds, and any stinkwort plants appearing was destroyed with the hoe.

Hawker, March 14.

Present—Messrs. A. C. Hirsch (Chairman), S. Irvine, C. W. Pumpa, R. Wardle, C. E. Harry, H. M. Borgas, Jas O'Loughlin, and J. Smith (Hon. Sec.).

Poisoning.—Mr. Irvine reported having placed a vessel containing poisoned water—2ozs. cyanide of potassium being dissolved in 12galls. of water—over night where rabbits were plentiful, and next morning the ground was literally thick with dead rabbits. He also dissolved 2ozs. cyanide in a gallon of water and steeped both wheat and pollard in it, and placed the baits where the rabbits were numerous. All the baits were taken, but not a single dead rabbit was to be found. Members would like to know how it was that such a powerful poison had no effect when wheat or pollard was steeped in it. [Unless the rabbits died in the burrows, I cannot even suggest why the poison failed to act.—Gen. Sec.]

Quorn Conference.—The Chairman and Hon Secretary reported in regard to the Conference of Branches at Quorn. They regretted that too many papers were accepted to allow of proper discussion, and that what was practically a political meeting should have shortened the time available for the Bureau meetings.

Golden Grove, March 26.

Present—Messrs. T. G. McPharlin (Chairman), J. R. Smart, Jas. Anderson, J. Woodhead, A. Robertson, J Ross, W. Mountstephen, F. Buder, and A. Harper (Hon. Sec.).

Apple-growing.—Hon. Secretary directed attention to an article appearing in a daily paper which contained the following:—"The apple orchard, which is a picture, comprises seven-year-old trees planted 20ft. x 24ft. Last year, which was not the best of seasons, each tree yielded on an average eight cases. This, at 2s. 6d. a case, means £1 a tree." This statement, analysed, means 560bush., or £70 per acre per annum for a handy little orchard of ten acres, at an actual outlay for the first seven years of say £500. The Hon. Secretary's experience, so far, had been different. This year his biggest crop yet from about four acres of apples, ranging from eight to thirteen years old, will be considerably less than 200 cases, inclusive of waste caused by wind and birds. This want of success he attributed a good deal to injudicious management; but did not think that with the best of management it could be more than doubled at that age, or say from 80bush. to 100bush. per acre. He did not agree with the generally accepted formulæ of pruning, especially of the apple, than which possibly no other tree is so frequently in want of sturdiness to bear heavy crops of fruit. He had, therefore, come to the conclusion that for strength the nearer the apple approaches to the natural shape of the pear the better. Low pruning is certainly very well if easily-picked and well sunburned fruit is required, and if there is no objection to digging on the knees in winter. He thought apple trees are still planted too closely. A thirty-year-old tree had already covered a space of more than 30ft. in diameter, and was nearly 30ft. high. It is well known that isolated trees in favorable soil will grow and increase in productiveness for many years after those in the middle of an orchard are either dead or useless. The members would be pleased if other Branches would give information as to phenomenal crops and probable crops of apples under favorable and varying conditions, also as to age and any other circumstances.

EXHIBITS.—Hon. Secretary tabled twelve varieties of apples and a season's growth of plum nearly 8ft. long., grown on a hillside under natural conditions. Mr. Smart had a watermelon nearly ½cwt. which he believed to be Mammoth Ironclad. It was reported that most of the seeds sent for trial by Central Bureau were of little use; but the Kentucky Wonder bean had proved to be by far the best yet tried.

Dowlingville, March 19.

Present—Messrs. R. A. Montgomery (Chairman), J Philps, T. Illman, R. Foggo, J. Birkin, G. Mason, F. W. Roberts (Hon. Sec.), and two visitors.

ATTENDANCE.—Resolved to strictly enforce the rule that members absent for three consecutive meetings without reasonable excuse be struck off the roll.

WHEAT BAGS.—It was decided to ask the General Secretary to write to Calcutta to ascertain wholesale price of bags at that place. [The General Secretary cannot undertake such work.—GEN. SEC.]

Renmark, March 15.

Present—Messrs. W. H. Waters (Chairman), W. H. Harrison, Captain Moffatt, F. S. Wyllie, M. Chapman, and E. Taylor (Hon. Sec.).

EXPERIMENTAL ORCHARD.—Business in connection with the establishment of the proposed experimental orchard and other formal matters were dealt with.

Meningie, March 12.

Present—Messrs. M. Linn (Chairman), Jabez Williams, T. W. R. Hiscock, W. Robinson, A. J. Myren, H. May, R. M. Scott, W. Tiller, W. J. Botten, C. J. Shipway, and H. B. Hacket (Hon. Sec.).

DISEASE OF PIGS.—A long discussion took place on cause and treatment of desease amongst pigs in this district. Pigs from ten weeks to four months old are attacked, first with staggering and dragging in the hind quarters, and knuckling over of the fetlock joints. They gradually get worse until they experience difficulty in rising. The pigs have been fed on separator milk, barley, and house refuse. They become constipated, but their appetite is unaffected. Mr. Tiller has lost nine pigs; he did not think the disease was contagious. Mr. J. Williams said his own pigs were unaffected, but the young of a sow he purchased became affected. Mr. Hiscock had lost pigs for three years in succession, so he got rid of the remainder and obtained new stock and had since had no trouble with them. It was decided to ask the Central Bureau to arrange for having an affected pig killed and examined by the stock inspectors in town.

Seed and Fertiliser Drills.—A committee was appointed to inquire *re* obtaining a seed and fertiliser drill for experimental use in this locality.

Norton's Summit, March 24.

Present—Messrs. J. Jennings (Chairman), J. J. Bishop, J. Pellew, Alex. Smith, J. Hank, and W. H. Osborne (Hon. Sec.).

Potatoes.—Mr. Bishop reported that in September he received some of the newly imported potatoes from the Chairman Central Bureau, and planted them in swamp ground prepared for potatoes, and in continuation of his own crop. He received fourteen varieties, the potatoes varying in size from a small marble upwards. Unfortunately the names were destroyed by accident, but the varieties having been planted separately the results were recorded as follows:—

No. 1.—Two setts planted produced thirty-four potatoes, weighing 10lbs.—skin white; one of the best; two of the tubers were over 6in. long.

No. 2.—One sett produced fifteen potatoes, weighing 2½lbs.—very poor; skin white.

No. 3.—Three setts produced forty potatoes, weighing 7½lbs.

No 4.—Two setts produced twenty-nine potatoes, weighing 6lbs.—good; white skin, full eyes; tubers clustering round the stalk.

No. 5.—One sett produced nineteen potatoes, weighing 4½lbs.—poor quality; stringy.

No. 6.—Two setts produced forty-five potatoes, weighing 7½lbs.—poor sample, there being sixty-three small potatoes.

No. 7.—Two setts produced forty-three potatoes, weighing 7½lbs.—red skin; very fair potato.

No. 8.—Four setts produced fourteen potatoes; weight, 2½lbs.—stringy and poor.

No. 9.—Two setts produced ten potatoes; weight, 2½lbs.—coarse and poor; very little good.

No. 10. Three setts produced thirty-six potatoes; weight, 7½lbs.—poor.

There were nine varieties in all, but one potato was loose and was planted separately.

In the above results potatoes smaller than walnuts have not been taken into account. The fourteen setts planted weighed exactly 8ozs., and produced 286 potatoes weighing 58lbs., besides 276 little potatoes weighing 9lbs. Nos. 1, 4, and 7 he considered to be very good varieties, but he proposed to give each kind a further trial.

Mr. Smith planted portion of the setts received from the Central Bureau, and promised to report on same at next meeting.

Weight of Chaff.—Discussion on this subject took place. The members consider purchasers of chaff should be protected against fraud, the same as purchasers of bread and other foodstuffs. Chaff is bought as going 40lbs. net per bag, but different members had found that bag and all the chaff they had purchased only weighed 35lbs. Then sometimes the bags are so much patched that when empty they weigh up to 5lbs. Members would like the Branches to consider this matter with the object of obtaining some satisfactory solution of the difficulty. [This matter of having a legal standard weight for the bag of chaff has been freely discussed at different times by most of our Branches, and in September, 1898, at our Annual Congress, a resolution asking the Government to legislate on the matter was passed. The Central Bureau has also recommended similar action on more than one occasion, but nothing has been done.—Gen. Sec.]

Gawler River, March 12.

Present—Messrs. A. M. Dawkins (Chairman), H. Heaslip, R. Badcock, J. Drinkwater, F. Roediger, J. Badman, D. Humphries, Chas. Leak, J. Hillier, J. S. McLean, W. Clark, H. Roediger (Hon. Sec.), G. S. Thomson (Dairy Instructor), and twenty-four visitors.

Dairying.—Mr. G. S. Thomson, in company with several of the members, drove round the district and inspected several dairies. In the evening he gave an address on "The Dairy Industry," which was well attended. The following are the principal points of his address:—

He strongly advocated that farmers should practise the industry with the assistance of science, and brought forward strong evidence of what science had done to further the interests of dairymen in Denmark. Denmark at the present time was our greatest rival in the markets of the world in the butter trade, and unless we followed hard on the lines laid down by the Danes we would find ourselves in the background. We in Australia had an advantage over our rivals in Denmark, seeing that the climate did not compel us to adopt the system of house feeding, and that our cattle were principally fed upon mature herbage, which tended to a high quality of milk with a distinctive aroma more pronounced than was found in the milk of Danish stock. Hence our butter had a flavor higher than that of Denmark Speaking of the requirements of the man who wanted to settle down and become a dairy farmer, the lecturer said he should first have a little capital. He should then choose land capable of carrying stock Many farmers had been unfortunate through reckless selection of land. If the man were single he should select a suitable wife. Those dairy farmers who were married gave good evidence that their wives were of considerable value to them; in fact, in many cases the wives made the money and the husbands enjoyed it. Then he should choose prime cattle. Nearer town a dairy farmer should breed more for quantity of milk and flesh; further out, more for cream. The lecturer described every milking breed of cattle, and pointed out the good qualities of each along with the bad ones. The different crosses of stock were also referred to. Feeding was the next point discussed On artificial foods, the lecturer referred to copra cake, and advised farmers to be very careful in its use, as an excess of this substance was inclined to go to flesh instead of milk. The udders of the cows would become thick and fatty, and the activity of the glands would therefore be reduced. Referring to grass, he said that fodder in dry matured condition was the ideal feed of the milking cow. It contained all the constituents required for the formation of milk and flesh. Dealing with the digestion of food, he said it was shown that feeding alone did not produce a rich quality of milk; that the farmer had to consider the breed of his stock in the way of increasing the fat percentage of milk. The saying was a true one, "Breed for quality; feed for quantity." Feeding maintained the animal's body, and as long as this was attended to the individuality and breed of the animal would give the richness to the milk. Alluding to the conditions influencing the quality and quantity of milk, Mr. Thomson gave many illustrations in order to prove that kind treatment and liberal feeding went towards maintaining a high standard of quantity and quality. The kind and considerate milker removed more milk of better quality from a cow than one who treated the animal roughly. The hunting of cows by dogs cost the dairy industry in this colony not a small sum of money. Farmers who were fortunate in possessing a number of paddocks could increase the quality and quantity by removing their cows from day to day to the different blocks. One might ask why these changes influenced the milk yield. The fact was the cow was an exceedingly sensitive animal. Her nerves governed the milk machinery, the glands of the udder. If there were nerve disturbances the activity of the glands became disturbed, hence the reduction in the richness and the yield of milk. The reason given for cows withholding their milk was based upon nerve disturbance, although in some cases the conformation of the teat and udder led to difficulty in removing the fluid. One of the greatest secrets of success in dairying was cleanliness. With inattention to cleanliness at the important process of milking it was utterly impossible to obtain a good keeping quality of milk, to obtain a good keeping quality of cream, and to manufacture a good quality of butter. It was in this respect that dairying had sustained and was sustaining tremendous injury, and until the farmers and the colony generally gave attention to and ensured supervision over their milking we would never attain the success we so much desired. When the milk was injured at this stage all the attainments of science were fruitless to remedy the evil. Referring to the souring of milk, the lecturer alluded to a case of souring due to the admittance of particles of dust and the presence of microbes, which found their way into the milk adhering to dust. It was the microbe feeding upon the sweetness of the milk which gave off the acids which caused the souring. The essential conditions for efficient separation were first of all purity of milk and, secondly, a suitable temperature. Milk should be separated immediately it came from the cow. Another point to be observed was the speed of the separator. Losses of cream had been caused through inattention to the passing of warm water through the separator before the admittance of the milk. A loss was also occasioned when the evening's milk was left till the morning to separate, when it became cold and somewhat acid. Low temperature and acidity combined rendered the milk in such a viscous condition that the centrifugal force was unable to accomplish its work. It was important that the slime from the bowls of separators should be burned or buried. Under no conditions should it be fed to pigs or any animals on the farm, as it contained injurious substances which tended to disease. The ripening of cream was the next point touched upon.

The lecturer explained that loss was sustained through inattention to ripening, and gave a practical means of testing the acidity of cream. This was by removing a small quantity by means of a spoon and tasting it. When the cream was at the proper standard of ripeness, that was, when it would yield the highest quantity of butter in churning, it imparted to the taste a sharp distinct acid flavor, followed by a slight sweetness. If the flavor was bitter, followed by acidity, it was over ripe, but if the cream appeared distinctly sweet, followed by a slight acidity, it was then under ripe Passing on to butter, Mr. Thomson dealt with this at considerable length. He pointed out the defects in the quality of butter and their remedies. Streakiness was very prevalent in butter made on dairy farms, and such a fault was the result of the use of inferior salt, and it not being thoroughly incorporated into the body of the butter. Concerning preservatives, he felt it his duty to protest strongly against the careless use of many of the so-called preservatives. Salesmen throughout the colony did not fully realise the dangers attached to these chemical substances sold under the different names of preservatives. Some contained a high percentage of boracic acid, others formaldehyde, and perhaps some contained still more injurious chemicals. It was customary in some parts for the dairy farmer to add a small quantity of one or the other, and in all probability it was added to the butter by the manufacturer without the knowledge of the farmers; hence the percentage was considerably increased in the manufactured article. It had been known that both milk and cream had had preservatives added before it arrived at the seat of manufacture. Referring to the export butter trade, Mr. Thomson said considerable dissatisfaction had been in evidence amongst producers of milk and manufacturers of butter in the colony, due to the action the Government had taken in the way of grading export butter at the depôt at Port Adelaide. Throughout the past export season a large quantity of very inferior butter had been shipped to England. To protect the name of South Australia in the British market he had found it necessary to use a pastry stamp upon the boxes containing the inferior butter. To command the attention of butter salesmen in the British market these low-grade butters had in more than one instance been packed into boxes bearing misplaced brands. The attention of the consumer to these brands had undoubtedly tempted them to purchase the butter and pay a price much beyond the commercial value of the article. How would that affect our colony once the consumer had burnt his fingers? It was but natural that a prejudice against the butter should prevail. Our system of grading not only protected the colony in general, but protected the manufacturer of the good article. The returns from the London market showed that the creditable manufacturer had had to content himself with prices ranging from 100s. up to 104s per hundredweight, and the low-grade butter had been quoted at from 92s. to 94s. per hundredweight. Large exportations of these low-grade butters had lowered to a considerable extent the value of the high quality product. The whole aim of the Government with regard to grading was to give justice and protection. The first quality butter was approved for export by a stamp; the second quality likewise; the third quality was untouched; and the really inferior received the pastry brand.

Forster, March 22.

Present—Messssrs. A. Johns (Chairman), C. Bolt, J. Retallack, C. R. Schenscher, J. A. Schenscher, J. D. Prosser (Hon. Sec.), and one visitor.

Seeding—A discussion took place on best methods of sowing wheat on different kinds of soil. Mr. Bolt believed in ploughing it in on sandy soil, while Mr. A. Johns would plough the land well, then sow the seed, and harrow once or twice to cover it. Members believed in harrowing in the seed on the hard soils. Mr. Prosser considered it would pay to use the drill and manure with super. on the sandy soils and with Thomas phosphate on heavy clay. Mr. Schenscher had seen splendid crop obtained from old land when suitable manures were applied.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— April 2, 1900.

The early days of March continued as dry as the month of February, but during the past couple of weeks the hoped for autumnal rains have fallen, and, though we cannot yet say that a thorough subsoil soaking has been given to the four years parched lands, the season has undoubtedly opened better than any for many years past, and farmers are now able to make an early start in preparing for seeding. The ground is still warm, so that vegetation is coming along well and a good winter supply of growing feed is assured, whilst tanks and dams have also been replenished. The heavy drop in the price of wool at the sales in Europe just cabled rather dims the bright prospects lately held by pastoralists, though some think that the fall, occurring at this season, is likely to be only temporary.

Trade is quiet but steady. Business houses doing with the agricultural districts find a little difficulty in getting their accounts cleared owing to the low ruling price of wheat, which makes holders in many instances disinclined to sell. Steady development continues in most mining districts, although no phenomenal discoveries have been reported.

In the grain trade a lifeless month can be recorded. The decline in bread stuffs on the London market that was setting in when writing last became established, and no recovery has since been shown. India ceased operating for wheat in Australia, and the South African markets are reported to be glutted with breadstuffs and fodder. Millers in our colony report only a hand-to-mouth local trade for flour, and almost an entire stoppage in export; but as growers who can afford to hold their wheat are in many instances doing so in expectation of better prices, sellers are not offering too freely. Sydney has maintained nearly a parity with this market, but Melbourne continues to rule about 2d. per bushel above Adelaide prices, and though millers in Victoria have been making a little better for their offal this alone does not account for the difference. There is no doubt that our Melbourne neighbours have managed to secure the bulk of the heavy South African trade, and by their enterprise have succeeded in establishing more frequent regular steamer communication, which has resulted in their producers obtaining better prices not only for breadstuffs but also for butter, cheese, bacon, honey, and other such lines, as well as finding an outlet for large quantities of their surplus fodder. In forage the month's trade in this colony has been very slack. Slightly improved prices have been obtained for bran and pollard in sympathy with higher quotations ruling intercolonially and there has also been a better demand for Algerian oats and Cape barley. These are the only lines, however, that have had much inquiry, other feeding grains, hay and chaff, being dealt in but for ordinary local requirements

Supplies of potatoes have been reaching market chiefly from Mount Gambier. Crops in the hills and southern districts being mostly used up, buyers are keenly competing for any prime samples left from the latter at up to 10s. per ton above what they will give for Gambiers, the quality of which, it is said, has deteriorated owing to the extensive cultivation of indifferent varieties. When Customs duties come to be abolished in a year or two, as the result of federation, the growers of potatoes throughout this colony will have to cultivate to keep up the standard of quality if they expect to maintain local trade. Firming markets intercolonially are causing holders here to look for an advance in price which we believe is likely to be secured soon. Most of the onions held and now being dug are of good keeping sorts, so that holders are advancing their price and endeavoring to realise higher rates. An extensive area was placed under this crop in the Mount Gambier district, but the yield is not nearly so heavy as last year, so that there is said to be but little probability of any excess over local wants.

In lines under the heading of dairy products a more than average month's business has been put through. The shrinkage in local supply of butter continued, so that increased importations of cream, as well as the manufactured product, became necessary to fill requirements of consumers. Most of this came from Victoria, where the dairy industry is completing a very favorable season, heavy South African and intercolonial demand setting in to relieve them of their surplus at the time when shipments to London were becoming unprofitable. Values of butter locally during the month have advanced in sympathy with improvement of price in Victoria, and until feed becomes more abundant here we must expect that market to control ours. Full supplies of eggs have been forwarded, but good local and strong export demand have absorbed all, so that a steady advance in price was secured, Western Australia, as usual, figuring heaviest as buyers at the auction sales. There is a dearth of good cheese, though still a lot of low-grade stuff about. The qualities made this season has not been up to usual standard, and the cause, in the opinion of some leading authorities, is the poor condition that most of our dairy herds got into during the three bad seasons of drought. Bacon has been very plentiful and prices low, but a decided better tone is setting in, late sales showing an improvement in values. Honey is in rather short supply, though very little advance in value obtainable. Beeswax finds brisk sale; and almonds meet with fair demand. The quality of poultry penned at the various sales during the mouth was hardly up to usual, so that average prices ruled lower, but an improvement at latest sale was evident and better prices obtained; turkeys only, as usual at this time of the year, selling cheaply.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 8d. to 2s. 8½d.; outports, 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 7s. 6d to £6 10s.; country, £5 15s. to £6 per ton of 2,000lbs.

Bran, 9½d.; pollard, 11d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 5d.; good stout white, 2s. 8d. to 2s. 9d. per bushel of 40lbs.

Barley.- Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. 3d. per bushel of 50lbs.

Chaff.—£3 12s. 6d. to £3 15s. 6d. per ton of 2,240lbs., dumped, bags in, f.o.b. Port Adelaide.

Potatoes.—Prime southerns, £3 5s. to £3 10s.; Mount Gambiers, £2 16s. to £2 18s. per 2,240lbs.

Onions.—£3 5s. to £3 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 2d. to 1s. 5d.; dairy and collectors', 10½d. to 1s per pound; bulk, 11d. to 1s. 0½d.

Cheese.—S.A. factory, choice, 6½d. to 7d.; ordinary to fair 4½d. to 5½d. per pound.

Bacon.—Factory-cured sides, 6½d. to 7d.; nice farm lots, 5½d. to 6½d. per pound.

Hams.—S.A. factory, 7½d. to 9d. per pound.

Eggs.—Loose, 11d.; in casks, f.o.b., 1s. 1d. per dozen.

Lard.—In bladders, 5d.; tins, 4½d. per pound.

Honey.—2¾d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 3½d. to 4d.; kernels, 9d. per pound.

Gum.—Best clear wattle, 1½d. per pound.

Poultry.—Good table roosters, 1s. 3d. to 1s. 6d. each; medium sorts to good hens, 1s. to 1s. 2d.; ducks, fit for table, 1s. 9d. to 2s.; a few light, 1s. 5d. to 1s. 8d.; geese, 2s. 9d. to 3s.; pigeons, 5d. to 6d.; turkeys, 3¾d. to 4¼d. per pound for fattening sorts; prime table birds, 4½d. to 5¾d.

Carcass meat.—Prime shop porkers, 4d. to 5d. per pound; good baconers, 3½d. to 4d.

MONTHLY RAINFALL.

The following table shows the rainfall for March, 1900: —

Adelaide	1·71	Riverton	2·10	Callington	1·55
Wilson	1·42	Tarlee	2·26	Langhorne's Bridge	1·64
Quorn	2·19	Stockport	2·12	Milang	1·45
Port Germein	1·38	Hamley Bridge	2·10	Wallaroo	1·45
Port Pirie	1·50	Kapunda	2·24	Kadina	1·42
Crystal Brook	1·68	Freeling	1·77	Moonta	1·93
Port Broughton	1·66	Stockwell	2·46	Green's Plains	1·85
Hammond	2·09	Nuriootpa	2·30	Maitland	3·16
Bruce	3·16	Angaston	2·13	Ardrossan	1·85
Melrose	2·05	Tanunda	2·99	Port Victoria	2·75
Wirrabara	1·61	Lyndoch	2·20	Curramulka	2·55
Appila	1·43	Mallala	1·69	Minlaton	2·62
Laura	1·34	Roseworthy	1·51	Stansbury	1·52
Caltowie	1·67	Gawler	2·32	Warooka	1·80
Jamestown	1·35	Smithfield	2·24	Yorketown	1·93
Gladstone	1·30	Two Wells	2·68	Edithburgh	1·68
Georgetown	1·68	Virginia	2·13	Fowler's Bay	3·24
Narridy	1·69	Salisbury	2·45	Streaky Bay	2·30
Redhill	1·46	Teatree Gully	3·18	Port Elliston	1·47
Koolunga	1·07	Magill	3·02	Port Lincoln	1·78
Carrieton	1·80	Crafers	4·44	Cowell	1·60
Eurelia	1·39	Clarendon	3·58	Queenscliffe	1·15
Black Rock	0·83	Morphett Vale	3·39	Port Elliot	2·00
Petersburg	1·37	Noarlunga	2·70	Goolwa	1·53
Yongala	1·17	Willunga	2·73	Meningie	2·93
Terowie	1·12	Aldinga	2·11	Kingston	2·16
Yarcowie	0·92	Normanville	2·17	Robe	1·61
Hallett	1·17	Yankalilla	2·21	Beachport	1·26
Burra	1·66	Eudunda	1·39	Bordertown	2·83
Snowtown	1.76	Truro	2·01	Wolseley	2·68
Brinkworth	1·53	Mount Pleasant	2·64	Frances	2·38
Blyth	1·74	Blumberg	2·68	Naracoorte	3·35
Clare	1·69	Gumeracha	3·47	Lucindale	2·23
Mintaro Central	1·28	Lobethal	3·86	Penola	2·73
Watervale	2·22	Woodside	3·43	Millicent	2·39
Auburn	1·71	Hahndorf	4·23	Mount Gambier	2·87
Manoora	1·23	Nairne	2·61	Wellington	2·09
Hoyleton	1·88	Mount Barker	3·54	Murray Bridge	1·56
Balaklava	1·31	Echunga	3·65	Mannum	1·01
Port Wakefield	1·60	Macclesfield	2·96	Morgan	0·62
Saddleworth	1·71	Meadows	4·05	Overland Corner	1·10
Marrabel	1·47	Strathalbyn	1·86	Renmark	0·98

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. Cornish, Secretary).

Conciliation and Arbitration in Trade Disputes.

The Industrial Conciliation and Arbitration Act, 1894, of New Zealand continues its good work in that country, and a recent number of the *Journal of the Department of Labor* prints some interesting particulars concerning several awards and recommendations made by the various district boards.

In connection with the Wellington drivers' dispute, involving certain points of difference between the Workers' Union and the employers on the matter of working hours and wages, the local board makes some very fair recommendations. Regarding the hours of labor, the board propeses that drivers employed in brick yards and timber yards shall be expected to work forty-six hours per week; coal dealers, parcel delivery, forwarding agents and carriers, and laundry men to work forty-seven and a half hours; whilst the hours for tram drivers shall be sixty and bus drivers forty per week. The weekly minimum wage to be paid to drivers of lorries and vans with two horses shall be £2 5s., or with one-horse vehicles £2 2s., a like amount being claimed for drivers delivering coal. Casual drivers shall receive 1s. per hour. The monthly wage to be paid to tram drivers is the same as embodied in the agreement made last year between themselves and the proprietors, ranging from £9 10s. to £11. The overtime rate is fixed at 1s. per hour for the first two hours, and afterwards time and a half. Sunday work, except looking after the horses, is to be paid double time. A full hour is very properly insisted upon for a meal each day. The public holidays are all to be paid for, except in the case of tram drivers and laundry drivers; compulsory work on such holidays shall be paid for at double rate. Drivers of picnic parties shall be paid 5s. per day extra

Concerning the Dunedin carpenters' and joiners' dispute the Conciliation Board for the industrial district of Otago and Southland recommends that the parties to the said dispute enter into an agreement for a term of two years, dating from January 1st, 1900. It is proposed that the week's work shall consist of forty-four hours in the building trade and generally, or in factories, forty-six hours. All time beyond this to be regarded as overtime and to be paid for at the rate of time and a half. Holidays to be paid for as overtime, and Sundays double ordinary rate.

The rate of pay shall be 1s. 3d. per hour, except in cases of incapable workmen, who shall be paid such less sum as shall be agreed to in writing by such workmen and the president and secretary of the union. Men sent to country jobs are to have their travelling expenses paid and their time going and returning, and an extra 1s. per day when agreement necessitates lodging. Limit to men walking to their work shall be one and a half miles from employer's place of business.

The rules applying to apprentices state that they shall serve five years to the trade, each employer being allowed one apprentice to the first three journeymen or part thereof, and one additional apprentice to every three additional journeymen or part thereof. Should an employer, from unforeseen causes, be unable to carry out his obligation to his apprentice, it shall be allowable for the lad to complete his time with another employer.

It is urged that members and non-members of the Amalgamated Society shall at all times work in harmony with one another.

Piecework is altogether abolished.

The North Canterbury Branch of the Carpenters and Joiners have already signed a two years' agreement with their employers to recommendations similar to the above, in pursuance to the Act.

The Court of Arbitration. after taking into consideration the matter of the dispute between the Dunedin wharf laborers and their employers, makes an award embracing the following terms, &c.:—

For all classes of work performed between the hours of 8 a.m. and 5 p.m. the rate of wages shall be 1s. 3d. per hour. Loading or discharging coal, or coaling ships' bunkers, between similar hours shall be paid at rate of 1s. 6d. per hour, except when loading bunker-coal in bags, when coal is to be treated as other cargo; when, however, the bags are carried by men 1s. 6d. is to be the rate.

Overtime is between hours of 5 p.m. and 8 a.m., and is to be paid at rate of 2s. per hour. For work done on Sundays, holidays, and during meal time, to be paid for as overtime. All the recognised holidays are to be observed, or otherwise paid for at overtime rates. Regular meal times are to be observed, and no person must be employed longer than five hours continuously without an interval for a meal.

All time after the first hour during which the men are waiting after having being told off to start work must be paid for at rate of half time.

Employers in employing labor shall not discriminate against members of the Worker's Union, and when members and non-members are employed together both shall work together in harmony and receive equal pay for equal work.

The Court similarly disposes of the dispute between the Dunedin painters and their employers, and imposes the following conditions:—

The recognised hours for work shall be from 8 a m. to 5 p.m. (8 a.m. to noon Saturdays), with one hour for lunch from August 1 to May 31, and from June 1 to July 31 from 8 a.m. to 4·30 p.m., with half hour for lunch each day except Saturday.

The minimum wage is fixed at 1s. 3d. per hour, except in case of less skilful workers, when conditions similar to those observed by the Dunedin Carpenters' and Joiners' Union are imposed. All overtime is to be paid for at the rate of time and a quarter for the first four hours, and time and a half afterwards on any day except Good Friday, Christmas day, and Sunday, which shall be paid for at the rate of double time. The rates of pay for workers on country and suburban jobs, as also for the employment, &c., of apprentices, are similar also to those assented to by the Dunedin carpenters and joiners.

The Federated Seamen's dispute with various shipowners was settled by the Court making terms, some of which are quoted below, subject, of course, to the usual limitations which shipping traffic demands.

The following rates of pay shall be paid:—A.B.'s, £6 10s. per month; trimmers, £6 10s.; firemen, £8 10s.; donkeymen, £9 10s.; lamp-trimmers, £6 10s.; lamp-trimmers and A.B.'s, £7 10s.; boatswains, £7 10s.; first class ordinary seamen, £4 10s.; second class ordinary, £3 10s.; first class boys, £2; second class boys, £1 10s. per month.

Overtime shall be paid at the following rates:—A.B.'s, ordinary seamen, and firemen, 1s. per hour; A.B.'s or ordinary seamen when engaged in trimming coal at loading ports, 1s. 3d. per hour; when engaged in carrying or stowing grain in bags in cargo steamers only, 1s. 3d. per hour. Boys shall not be worked overtime.

The hours of labor at sea shall be, on deck, watch and watch of four hours each; in stokehold, watches of four hours on and eight off. On small steamers running short trips, and where only two firemen, greasers, or trimmers are carried, watch and watch of six hours, but men employed on six-hour watches shall be paid £1 per month extra. Between 5 a.m. and 5 p.m. on intercolonial steamers, and between 6 a.m. and 5 p.m. on coastal steamers seamen on watch shall perform any work required of them. Any work performed by them outside these hours must be paid for as overtime, except in cases of necessity for the navigation or safety of the ship, or clearing decks, &c., for half an hour after leaving port. Firemen, greasers, and trimmers shall work as required during their watches. When the watch below is required to do any work otherwise than what is necessary for the navigation and safety of the ship shall be paid overtime. When a steamer is under banked fires night or day, the whole watch shall, if it be necessary in the opinion of the chief engineer, remain on duty in the engine-room and stokehold, and perform any duty that may be required. No overtime to be paid for cleaning tubes nor for discharging ashes after leaving port.

In port the hours of labor shall be fixed at eight, viz., from 7 a.m. till 5 p.m., with two hours for meals. During the foregoing hours the seamen shall work cargo, &c., as required. Any work done beyond the eight hours, where three watches are kept, shall be paid for as overtime, or an equivalent time shall be allowed off in port. When time off is charged against overtime it shall be equivalent to the same in monetary value, and shall be given at the home port or at the port where the man resides. This clause shall not affect night watchmen. When in port or at anchor in bays or roadsteads the eight hours shall be between 7 a.m. and 5 p.m. by sea watches, as circumstances require. Watch and watch shall be kept where only two firemen, greasers, or trimmers are carried. Sea watches in stokehold on days of sailing and arrival shall count as portion of the eight hours.

Overtime in port counts from between 5 p.m. and 7 a.m.; firemen, greasers, and trimmers being paid for all hours in excess of eight in the twenty-four. Night watch in port shall be from 8 p.m. to 6 a.m. Married men need not work overtime in their home port so long as not less than half the crew remains on board.

When a vessel arrives in port after 5 p.m. on a day preceding a holiday or Sunday, two hours shall be allowed for washing decks, &c., without payment of overtime. If arriving on Sunday or a holiday, half an hour shall be allowed without payment of overtime; but should a vessel arrive and sail same day at either of these times, overtime shall be paid to the whole crew, not exceeding 8s., and not less than 4s. per man. Firemen getting up steam before leaving port shall also be paid overtime. Boat and fire drill will not be paid for as overtime. Twenty-four hours' notice on either side shall be the rule of discharge in the port where the ship's articles have been drawn out; in other cases a free passage back to the final port must be provided.

The Otago coal miners and their employers also agreed, on the recommendation of the Court, to abide by the following rules for a period of two years. After deciding that balloting for places should take place every three months, according to stated rules, the rates for piecework, &c., were fixed as follows:— Headings, 3s. 6d. for every three boxes, and 7s. per yard when worked by one shift, and 3s. 6d. for three boxes and 8s. per yard when worked by two shifts. Levels, 3s. 6d. for three boxes and 5s. per yard when worked by one shift, and 6s. when worked by two shifts. Bords, 14ft. wide, 3s. 6d. for every three boxes. Stentons, not less than 12ft. wide, 3s. 6d. for three boxes and 6s. per yard. Pillars, when taken back in the solid, 3s.; when in strips, 3s. 6d. for every three boxes, or shift wages shall be paid. Head coal, 3s. for three boxes where not less than 6ft. of a carry. Shift wages shall be 10s. per shift. Deficient places, wet places, and when brushing headings shall be paid shift wages. No coal shall be worked on shift wages where piece rates have been fixed, except by arrangement between manager and Union. Hours shall be eight hours per shift at the face. Any timbering work to be paid for by shift wages. Truckers over 19 years of age shall be paid not less than 7s. per day; under that age 5s. per day, unless a special wage agreed upon by Union and manager.

In all the above cases submitted under the Act the employers and employés signed agreements that the awards recommended by the board should be adopted for two years.

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Journal of Agriculture

AND

Industry.

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NOTES AND COMMENTS.

The present season has opened most auspiciously, and it is doubtful whether we have had a more favorable opening during the past seven or eight years. Sir Charles Todd. in his weather report for March, states that the month's mean temperature was the lowest for March since 1888. and the next lowest on record. Taking the month as a whole, he considered it doubtful if we ever had a more promising opening for the season. especially in the Northern Areas; certainly not for many years. To find parallel cases we have to go back to 1884 and to 1877. The favorable conditions have continued during the past month, showery weather being experienced over the whole period. As will be seen from the weather and crop reports, these favorable conditions are general, only one or two stations on the outside of the wheat-growing areas suffering from unfavorable conditions. In the lower north and south the grass is making splendid progress, and the indications point to a very favorable grass season. Seeding operations have been pushed forward under most favorable circumstances, and in the earlier districts is about finished. The unusual wet weather during March resulted in considerable losses of apples, some of the varieties cracking so badly that less than 50 per cent. of those left on the trees were saved. Strawberry Pippins suffered very severely.

The question of the advantages of the American system of handling wheat in bulk over the bag system adopted in Australasia has been receiving considerable attention in the adjacent colonies, and has been touched on in this colony. It would appear to us that the advocates of the elevator system of handling wheat overlook the fact that while its adoption would cost many thousands for fitting up central elevators, receiving stations, farm wagons, railway trucks, &c., the total wheat exported from any one port in Australia is too small to profitably employ a single large elevator for more than a few weeks. . In America the elevator system has been adopted with the result of reducing the cost of handling wheat to a low margin, but it must be remembered that the United States produces about one-fourth of the wheat grown in the whole world. Australasia scarcely produces one-twentieth of the wheat that is grown in the United States, and only a portion of this is exported; consequently the interest alone on the outlay involved in building elevators, &c., would amount to a serious charge per ton of wheat handled, to say nothing of the cost of labor, &c.

During the past three years most of the agricultural magazines have published particulars concerning the enormous losses caused by the spread of the Water Hyacinth on the St. John's River, in Florida. This handsome little aquatic has spread from the back waters of the river until now it has obtained such a hold that it absolutely blocks navigation at times and endangers the bridges owing to the accumulation of material against the piers forming a natural breakwater. It was introduced in 1890 from a pond near the river; when the pond was cleaned out the refuse was thrown into the river. The plant spread to such an extent that in 1897 it was abundant and troublesome for a distance of 200 miles. Many of the tributaries of the river are covered by a solid mass of the plant. It is estimated that the shore lines of the river, creeks, and marshes invaded by the plant on the St. John's alone exceeds 1,000 miles. Thousands of pounds annually are spent in keeping portions of the river free of the weed sufficiently to enable vessels to pass. In many other slow-flowing creeks and rivers similar damage and loss has resulted, and we regret to see it reported that in parts of the River Clarence, in New South Wales, it is spreading and causing serious alarm. South Australia affords few opportunities for this plant to do much harm; still it would be a national calamity should it be introduced to and spread on the Murray.

Sulphate of potash, 20lbs. per acre, mixed with Thomas phosphate, 1cwt. per acre, has given better results on a Yorke's Peninsula farm than were realised from any other fertilisers, although a great many varieties were tried experimentally.

Gardeners suffer heavily through sparrows eating the foliage of their young pea plants. A sure preventive is to stretch a single thread of finest black cotton about 8in. above the ground on each side of the rows, and about 6in. from the centre of each row. It has been stated that a fair sprinkling of superphoshate will prevent the sparrows touching the plants. This is worth a trial.

The Minister of Agriculture in New South Wales proposes at the first opportunity to secure the repeal of the Vine Diseases Act, and to leave vinegrowers to their own resources on account of the enormous expense of £50 per acre at present incurred in dealing [Or failing to deal.—Ed.] with the phylloxera pest.

Mr. A. Harper, Golden Grove Branch, writes respecting wider planting of apple trees:—"Having been conducting some underground operations about 15ft. distant from a thirteen-year-old apple tree, I found that the roots had extended beyond that distance, and also to about 7ft. deep in a rather impenetrable subsoil, consisting of a very hard yellow clay mixed with gravel and boulders. From this I concluded that the tree roots would have penetrated as deep as the tree was high, say 10ft. or 12ft."

A new disease of tomato plants has been introduced into Australasia from England, where it is very prevalent. It is of a fungus nature and is named Fusarum lycopersici. The fungus first attacks the roots, discolors the tissues, *and causes the sudden death of the plants. If ripe fruit is on the plants the* seeds will be affected, and the plants resulting from sowing that seed will spread the disease. When any plant is found to be affected it should be pulled up and burned, and the soil where it was growing should be liberally dressed with quicklime to destroy the scattered spores and prevent spread of the disease.

California Fruitgrower says that an English mail advice complains that much of the Canadian and American fruit lately arrived has caused a general want of confidence on the part of buyers, and there is no doubt that prices have suffered considerably in consequence. An Oregon paper makes much stronger remarks concerning Californian apples, and South Australian growers should take particular notice of these complaints. Not only does the inferior fruit or badly graded and packed fruit suffer in price, but several following shipments will be viewed with suspicion, and low prices will be offered. One careless or dishonest act will entail a bad character on the perpetrator; but many years will be required to wipe off the stain, and one man's sin in such a case is visited upon the whole of the fruitgrowers of his country or colony.

It has often been asserted that an acre of watermelons will produce four or five times more syrup than an acre of sorghum. It pays very well in the United States to grow sugar sorghums for syrup, and it is strange that the farmers do not grow watermelons for syrup if that is the case. Recently it has been decided to erect public factories in Washington and Idaho, for the manufacture of syrup and vinegar from watermelons. It is said that it will cost only 1s. 3d. per gallon for the manufacture of syrup, and 7½d. per gallon for vinegar.

Sweet melons are not always at their best when freshly gathered. They are ripe when the tendril nearest to the fruit is dry, but the melon should be kept on the shelf until the "eye" opposite the stalk becomes soft enough to press inwards under moderate pressure. Watermelons are ready to cut when the first tendril becomes dry.

There is a great deal more than enough rain each year on the greater part of the settled districts to ensure luxuriant crops of grain, fruit, and vegetables, but probably 90 per cent. of the water runs away to the nearest channel and thence to the sea. The time will come when our people will contrive to save the chief portion of this golden stream.

Paris newspapers of January 9, 1900, state that Professor Lassere, of the district of Puntous, Hautes Pyrenees, has discovered that 3pts. of common chimney soot buried at the foot of each vine in the winter will penetrate to the extremities of the roots, and will kill all phylloxera insects. As we have no phylloxera in South Australia the information would be of little use were it not for the fact that we have two or three other species of aphis which attack the roots of fruit trees. (Phylloxera vastatrix is a species of aphis.) Thus we have Schizoneura lanigera, or American woolly blight, on our apple trees, and Myzus cerasi, or peach aphis, on our peach trees, and if soot will kill phylloxera it will equally destroy the apple and peach aphides. Try the remedy during July or August.

Reports that cattle have been poisoned through eating young green sorghum have repeatedly been circulated, but there is nothing of a poisonous nature in the plant. It is true, nevertheless, that many cattle have died soon after feeding on green sorghum, but the cause of death has been due to tympanitis, otherwise excessive distension of the stomach through generation of gases. The animals have been hungry and have eaten too rapidly and too ravenously of the succulent green food. The same effects would follow from feeding upon clover, or any similar succulent green feed under similar circumstances, when the animals would become "blown" or hoven. Have the sorghum cut and left in the field for a few hours, or else turn the cattle on when they are fairly full, and no evil consequences will follow.

It is an easy matter to prevent fowls flying on to stacks and scratching holes in the thatch. Drive pegs into the eaves 8ft. apart, leaving 1ft. of each protruding. Stretch a fine wire near the tops of the pegs, and another 4in. nearer the stack. The fowls always fly first for the eaves, and when they strike the wires they are thrown back in confusion. They seldom try more than once.

Californian horticulturists are doing considerable business with Hamburg in dried fruits, especially dried plums, which are called "prunes." This year there is a great shortage in the plum crops all over the world estimated at 120,000,000lbs.

A new sheep-shearing and grass-mowing contrivance is about to be placed upon the world's market by Messrs. Meacock & Penn, of Birmingham. It is called the "Rotary Sheep-shearing Machine." The cutter is something like a circular saw, with long curved teeth or blades, cutting across a lunar-shaped comb. The motion is communicated from the shafting through flexible tubes to the handle of the machine, and thence to the revolving blades by means of a short shaft with two bevelled cogwheels. For mowing grass lawns the motion is contributed from the wheels of the lawn mower to the circular cutter in front. It has yet to be proved that this is any improvement upon existing patterns of sheep-shearing machines.

ANNUAL REPORT OF THE CHAMBER OF COMMERCE.

Corn Trade Sectional Committee, 1899-1900.

One of the most marked features in connection with the trade has been the great increase of exports. During the year closing December 31st, 1899, the exports of wheat amounted to 3,149,899bush., and of flour 49,865 tons, equal in all to 151,155 tons wheat, as against 31,248 tons exported in 1898. *The Register* estimated the area reaped was 1,550,000 acres, yielding 9,816,666bush., or 6bush. 20lbs. average, but the Government return published later gave an acreage of 1,788,770 under wheat, with a yield of 8,778,900bush., or an average of 4·91bush. per acre.

The course of the market during the aforesaid period showed no violent fluctuations in prices. During the earlier months quotations remained steady at 2s. 8d. to 2s. 9d. per bushel. In June prices advanced to 2s. 10d. per bushel, rising later to 3s. 2d. to 3s. 3d., and declining in November and December, as the new crop became available, to 2s. 8d. to 2s. 9d. per bushel. Prices for flour moved in sympathy with wheat, fluctuating from £6 10s. to £7 5s. for best brands. The demand for South Africa has been large, the exports being of flour 14,708 tons, and wheat 715,419bush.

Coming to the present year (1900). *The Register* estimates the crop at 10,200,000bush., and the area reaped from 1,700,000 acres, being an average of 6bush. per acre. The Government estimate is 1,821,137 acres sown, producing 8,453,135bush., an average yield of 4·64 per acre. In connection with these estimates it will be noted that *The Register* bases on the acreage reaped, and the Government on the area sown.

Values for wheat during January and February showed little change, opening at 2s. 7½d. to 2s. 8d. per bushel, and advancing to 2s. 8½d. to 2s. 9d. per bushel at Port Adelaide, best brands of flour being quoted during the same period at £6 5s. to £6 10s. per ton.

On January 10th your Committee met to decide upon the standard sample of the year. The weight per measured bushel was fixed at 63lbs., being the same as last year. This decision has given rise to severe, though unjust. criticism, founded in the main upon ignorance of the functions and province of your committee, and it may, therefore, not be out of place to state the *modus operandi* adopted in fixing this standard. Samples are obtained from all the merchants, millers, dealers, and the Farmers' Co-operative Association, of wheat which they have accepted from farmers without deduction, and also from branches of the Agricultural Bureau, and upon the average of these samples your committee base their decision, their province being to deal with the facts as presented, so as to obtain a fair average sample of the season's crop for trading purposes—not to fix an abnormally high standard, in order to induce growers to clean their wheat better.

During the past year a large and increasing area of land has been treated with artificial manures and the growing demand indicates that farmers find it profitable to use such fertilisers.

The following table shows the quantity of wheat and flour exported for three months ending March 31st in each year since 1884:—

	Average Bushels per Acre.	Flour—Tons.	Wheat—Bushels.
1884	7·56	21,925	3,109,000
1885	7·32	21,033	5,278,000
1886	3·10	15,143	363,000
1887	5·30	22,708	1,077,000
1888	9·45	21,224	3,954,000
1889	2·8	18,841	556,000
1890	7·55	19,554	3,309,000
1891	5·37	16,828	3,669,582
1892	4·9	17,633	924,352
1893	6·5	12,835	3,112,800
1894	8·8	13,179	3,227,583
1895	4·52	12,905	1,412,830
1896	4·22	20,341	355,628
1897	2·46	4,467	960
1898	2·38	6,206	11,425
1899	4·91	12,361	1,710,174
1900	4·64	17,448	1,500,453

AGRICULTURAL STATISTICS,

TABLE I.—*Return showing the Area of Wheat Sown for Grain and for in South Australia, during the Seasons* 1898-9 *and* 1899-1900,

Division and County.	Wheat for Grain.					
	Area.		Produce.		Average Yield per Acre.	
	1898-9.	1899-1900.	1898-9.	1899-1900.	1898-9.	1899-00.
	Acres.	Acres.	Bushels.	Bushels.	Bushls.	Bushls.
I. CENTRAL—						
Adelaide	26,316	17,367	246,904	140,154	9·38	8·07
Albert	31,663	32,066	138,354	150,510	4·37	4·69
Alfred	6,232	9,112	24,696	54,118	3·96	5·94
Carnarvon	387	323	2,668	3,242	6·90	10·00
Eyre	121,212	123,134	518,814	396,083	4·28	3·22
Fergusson	84,823	94,837	637,883	509,358	7·52	5·37
Gawler	92,302	97,265	709,420	571,020	7·69	5·87
Hindmarsh	11,510	10,190	100,510	85,232	8·73	8·36
Light	86,936	70,792	774,333	556,200	8·91	7·86
Sturt	83,520	78,457	435,655	374,407	5·22	4·90
Total ..	544,901	533,543	3,589,237	2,840,324	6·59	5·32
II. LOWER NORTH—						
Burra	41,793	45,610	110,298	112,200	2·64	2·46
Daly	207,011	223,604	1,179,549	952,357	5·70	4·26
Hamley	265	—	268	—	1·01	—
Kimberley	36,436	33,398	33,960	81,854	·93	2·45
Stanley	123,802	118,305	883,696	730,604	7·14	6·18
Victoria	114,160	121,742	605,203	668,793	5·30	5·49
Young........	3,375	4,038	12,526	9,066	3·71	2·25
Total ..	526,842	546,697	2,825,500	2,554,874	5·36	4·67
III. UPPER NORTH—						
Blachford	15,023	16,126	36,772	77,982	2·45	4·84
Dalhousie	170,030	172,490	446,220	715,500	2·62	4·15
Derby	—	—	—	—	—	—
Frome	150,986	147,148	551,010	730,864	3·65	4·97
Granville	74,818	65,652	76,086	98,984	1·02	1·51
Hanson	31,390	36,140	56,462	72,640	1·80	2·01
Herbert	28,587	27,366	27,052	74,500	·95	2·72
Lytton	—	—	—	—	—	—
Newcastle	60,175	70,110	184,700	285,866	3·07	4·08
Taunton	703	880	2,322	24	3·31	·03
Total ..	531,712	535,912	1,380,624	2,056,360	2·60	3·84

SEASON 1899-1900.

Hay, and the Quantities of Wheat and Hay Produced, in each County together with the Average Yields per Acre and Average Rainfall.

Wheat for Hay.						Rainfall (Approximate Mean).	
Area.		Produce.		Average Yield per Acre.		1898.	1899.
1898-9.	1899-1900.	1898-9.	1899-1900.	1898-9.	1899-00.		
Acres.	Acres.	Tons.	Tons.	Tons.	Tons.	Inches.	Inches.
47,816	48,274	57,228	50,440	1·20	1·04	27·943	23·201
2,658	2,583	2,002	1,750	·75	·68	10·478	10·876
1,000	851	500	618	·50	·73	8·528	10·176
453	588	358	717	·79	1·22	18·278	18·422
14,620	13,310	9,858	5,954	·67	·45	12·197	9·958
17,127	14,280	11,940	7,183	·70	·50	17·700	12·419
33,043	32,267	30,406	22,340	·92	·69	16·872	12·979
7,423	8,770	7,486	9,072	1·01	1·03	22·188	19·602
32,310	34,966	29,181	28,610	·90	·82	20·662	16·360
10,845	10,673	8,057	7,433	·74	·70	17·553	15·050
167,295	166,562	157,016	134,117	·94	·81	17·240	14·904
3,988	4,867	1,713	2,028	·43	·42	10·903	10·996
26,933	21,838	18,304	9,735	·68	·45	15·153	10·972
663	332	516	194	·78	·60	8·528	10·176
820	2,166	203	916	·25	·42	10·700	11·485
23,442	23,247	17,632	15,354	·75	·66	19 836	14·935
34,146	32,962	22,254	23,263	·65	·70	13·720	14·182
360	230	305	107	·85	·47	10·478	10·876
90,352	85,642	60,927	51,597	·67	·60	12·760	11·946
925	1,073	374	583	·40	·54	10·075	10·220
12,033	15,332	5,222	9,783	·43	·64	10·357	11·088
—	—	—	—	—	—	6·485	4·910
19,376	15,630	12,140	12,012	·63	·77	12·197	12·211
724	717	405	380	·56	·53	7·705	8·667
550	336	200	110	·36	·33	7·180	7·265
346	627	135	334	·40	·53	6·826	6·881
—	—	—	—	—	—	6·637	5·433
4,983	4,614	3,913	3,103	·79	·67	10·657	10·089
283	110	158	20	·40	·18	8·827	7·346
39,220	38,439	22,547	26,325	·57	·68	8 695	8·411

AGRICULTURAL STATISTICS,

TABLE I.—*Return showing the Area of Wheat Sown for Grain and for in South Australia, during the Seasons*

Division and County.	Wheat for Grain.					
	Area.		Produce.		Average Yield per Acre.	
	1898-9.	1899-1900.	1898-9.	1899-1900.	1898-9.	1899-1900.
	Acres	Acres.	Bushels.	Bushels.	Bushls.	Bushls.
IV. SOUTH-EASTERN						
Buccleuch	4,040	5,380	15,540	21,472	3·85	3·99
Buckingham ..	11,202	12,767	103,937	111,676	9·28	8·75
Cardwell	120	180	960	1,350	8·00	7·50
Chandos	40	184	180	166	4·50	·90
Grey	16,735	8,093	268,574	81,704	16·05	10·10
MacDonnell ..	2,612	2,203	30,373	23,894	11·63	10·85
Robe	3,274	4,496	51.245	38,728	15·65	8·61
Russell	11,702	10,147	54,735	47,144	4·68	4·65
Total ..	49,725	43,450	525,544	326,134	10 57	7·51
V. WESTERN—						
Buxton	—	—	—	-	—	—
Dufferin	1,580	2,655	4,618	10,750	3·56	4·05
Flinders	12,003	13,133	77,096	88,680	6·42	6·75
Hopetoun	2,985	4,205	6,028	15.500	2·02	3·69
Jervois	28,987	30,850	117,106	109,375	4·04	3·55
Kintore	19,042	23,353	30,260	60,285	1·59	2·58
Manchester	355	350	482	770	1·36	2·20
Musgrave	12,862	12,868	52,678	73,942	4·10	5·75
Robinson ...	29,012	38,237	122,005	183,690	4·21	4·80
Way	27,664	35.364	45,222	131,267	1·63	3·71
York	1,100	520	2,500	1,184	2·27	2·28
Total ..	135,590	161,535	457,995	675,443	3·38	4·18
SUMMARY.						
I. CENTRAL	544,901	533,543	3,589,237	2,840,324	6·59	5·32
II. LOWER NORTH	526,842	546,697	2,825,500	2,554,874	5·36	4·67
III. UPPER NORTH	531,712	535,912	1,380,624	2,056,360	2·60	3·84
IV. SOUTH-EASTERN	49,725	43,450	525,544	326,134	10·57	7·51
V. WESTERN	135,590	161,535	457,995	675,443	3·38	4·18
GRAND TOTAL..	1,788,770	1,821,137	8,778,900	8,453,135	4·91	4·64
Increase	—	32,367	—	—	—	—
Decrease ..	—	—	—	325,765	—	·27

Chief Secretary's Office, Adelaide, April 4th, 1900.

SEASON 1899-1900—*continued.*

Hay, and the Quantities of Wheat and Hay Produced, in each County 1898-9 *and* 1899-1900, *&c.*—continued.

Wheat for Hay.						Rainfall (Approximate Mean).	
Area.		Produce.		Average Yield per Acre.		1898.	1899.
1898-9.	1899-1900.	1898-9.	1899-1900.	1898-9.	1899-1900.		
Acres	Acres.	Tons.	Tons.	Tons.	Tons.	Inches.	Inches.
257	367	173	205	·70	·56	—	—
2,483	2,324	2,070	2,027	·83	·87	20·600	15·875
38	44	25	34	·66	·77	—	—
—	—	—	—	—	—	—	—
4,662	5,314	6,750	7,026	1·45	1·32	26·284	26·718
891	548	1,035	647	1·16	1·18	23·283	20·143
2,364	1,985	2,784	2,063	1·18	1·04	22·406	21·326
1,417	1,513	1,005	1,217	·71	·80	13·911	15·040
12,112	12,095	13,842	13,219	1·14	1·09	21·297	19·820
—	—	—	—	—	—	—	—
103	90	35	56	·34	·62	—	—
2,192	2,500	1,595	1,710	·73	·70	18·362	16·929
52	60	24	30	·46	·50	—	—
1,403	1,285	834	575	·60	·45	10·098	9·688
130	485	33	165	·25	·34	7·725	9·450
—	—	—	—	—	—	7·026	5·883
1,582	1,783	738	920	.47	·52	12·633	13·732
1,852	2,147	884	892	·48	·42	12·123	10·410
120	337	43	183	·36	·54	12·650	10·450
—	15	—	11	—	·57	—	—
7,434	8,702	4,186	4,542	·56	·52	11·645	10·932
167,295	166,562	157,016	134,117	·94	·81	17·240	14·904
90,352	85,642	60,927	51,597	·67	·60	12·760	11·946
39,220	38,439	22,547	26,325	·57	·68	8·695	8·411
12,112	12,095	13,842	13,219	1·14	1·09	21·297	19·820
7,434	8,702	4,186	4,542	·56	·52	11·645	10·932
316,413	311,440	258,518	229,800	·82	·74	14·327	13·203
—	—	—	—	—	—	—	—
—	4,973	—	28,718	—	·08	—	1·124

L. H. SHOLL, Under Secretary and Government Statist.

OPHTHALMIA IN CATTLE.

Complaints are again being made of the prevalence of bovine ophthalmia in the northern parts of South Australia. This disease, if left unattended to, may result in total blindness of the affected animal. The cause may be due to excess of light, reflected from the dry grass, access of dust, cold or very hot dry winds, and it is supposed to be contagious to a greater or lesser extent. The first symptom is inflammation, or redness of the eyeball and watery discharge from the eyes. Then the eyelids swell, and the eyes are scarcely visible. The eyeball first assumes a bluish tint, then becomes whitish, and finally yellow, swollen, prominent, and streaked with blood veins. Naturally the animal suffers severely, becomes feverish, and cannot feed. Cows go off in their milk. The first treatment is to remove the animals to a dark place, where they can have plenty of cool water in troughs. If Epsom salts at the rate of 2ozs. to the gallon can be added it will be most desirable. Dairy cows and other quiet cattle should have a dose of 12ozs. Epsom salts, 2 drams of capsicum tincture in a wine bottle of water. Bathe the eyes morn and eve with a lotion composed of 2ozs. tincture of opium, 4ozs. spirits of wine in 1pt. of water. Keep them in a dark cool place, and give then plenty of cool water in troughs.

SHEEP AND SKIN STEALING.

Bitter complaints have been made for a long time past of the stealing of sheep and the trading in skins of stolen sheep that is carried on in the outside agricultural districts of South Australia, Victoria, and New South Wales. Numerous and varied have been the suggested methods of dealing with this evil, but up till the present time no practical remedy has been adopted. It has been asserted that men have driven small flocks of sheep to the country stations (having previously ordered trucks to be in readiness) and sent them into the saleyards through a confederate, and received and cashed the cheques before the owners had discovered the loss of their animals. This is not so difficult a matter where sheep are kept in fairly large paddocks with no shepherd or caretaker, and where, perhaps, they are not looked after more than once or twice a month. Perhaps this form of theft could be checked somewhat if each person proposing to truck sheep were required to give notice, giving full particulars as to number, brands, and owner, and if the stationmaster were also required to write a memo. at once to the presumed owner reminding him of the proposed transfer of his stock. A list of sheepbreeders in the district should also be kept at each railway station for reference by the stationmasters. With respect to the stealing of sheep for the sake of their skins, and to sheep-stealing by "scrub squatters," perhaps the following clipping from the *Australasian* may afford a hint as to how they might be stopped in their evil courses:—

> The Kowree council have resolved to ask the Municipal Association to protect sheepowners by giving their support to the following resolutions:—"That persons buying skins be compelled to have a special licence, such licence to be issued for certain districts; that the number of licences be limited according to the number of sheep in the district for which a licence is issued; that buyers should keep an account of all purchases, with the number of skins, and also the brands and distinguishing marks and the name of the seller; that the licence and the book and the skins be produced for inspection by the police at any time; and that it be punishable for any skinbuyer to be found with skins having the brands or distinguishing marks defaced, unless a satisfactory explanation can be given."

SOME OBSERVATIONS ON FISHINESS IN BUTTER.

By G. S. Thomson, N.D.D., Dairy Instructor.

The human flesh is exposed to many diseases, some simple and readily understood, others obscure and seemingly beyond the grasp of the medical scientist. The practitioner records success according to his ability to diagnose diseases at the immediate outset, and to skilfully bring the sufferer to a speedy recovery. Diagnosing and treatment, however, do not necessarily pertain to the seat of the cause of the malady, and science is still baffled with regard to the true origin of more than one of our most loathsome diseases. The bacteriologist has as yet an unbeaten foe in the germs of cancer, and dairy students have long failed in the discovery of the cause of that costly form of deterioration exhibited in the presence of a fishy flavor in our butter. It is a simple matter to diagnose its presence, but it is annoying to be unable to find the origin of its entrance. We are far from the solution of the long-standing mystery, and authentic evidence is required to enable us to decide whether fishiness is a true bacterial or a purely chemical disease. Fortunate it is for the industry that fishiness does not affect butter with equal severity throughout the entire year, but it is characteristic that the flavor is pronounced when the green food of milking stock is at its immature or amidal condition. From the fact that fishiness is marked throughout the months of August, September, and October, one is tempted to inquire into the botanical side of the subject of green food for milking stock, and to base some apprehensions that fishiness is associated with plant life. Looking at the bacteriological side of the question, we know that specific organisms have been found peculiar to certain species of plants, and their abundance at certain periods in the growth of herbage is not discredited. Unfortunately information is inadequate in this branch of bacteriology to furnish the investigator with much scientific assistance.

That the keeping quality and flavor of butter is dependent to a more or less extent on the character of food and soils does not stand alone with dairy produce. Personal experience in the manufacture of cheese in different parts of Britain and in South Australia has convinced me that a certain taint in cheese is the outcome of rank and succulent green food of milking cows in the months of rapid growth, when the constituents of the plant go to produce a weak and bodyless quality of milk, poor in hard fats. It is reasonable to assert that the passage of immature and slushy food through the animal's body is too rapid for the digestive juices to perform their functions; hence the blood stream from which the milk constituents are removed must be charged with unusual substances, conducive to chemical changes in the composition of the milk. We agree that the richest and best-flavored milk is obtained from cows fed on solid and nutritious herbage, eaten off the land in the dry seasons of the year. The period of digestion of this matured food is slow; hence the more thoroughly will the albuminoids be changed into peptones by the gastric juice, and the action of the intestinal, pancreatic, and biliary juices will be consistent with the quality of the food. Again, with matured food we find living ferments accompanying the cells of the plant, their duties being not only to change starch into sugar, but to digest the woody fibre.

With immature food this stage of self digestion will be absent.

That disagreeable taints in milk, butter, and cheese result from certain foods is strikingly illustrated when green growing lucern is fed to cows, also when either rape, cabbages, sour silage, or turnips is given too freely without drier and matured food to replace the deficiency in albuminoids, fats, carbohydrates, and minerals, and to extend the period of digestion. The danger peculiar to lucern is partially overcome when the forage is fed in a withered condition, having less volatile constituents and with increased fibre. In this way a form of maturity is obtained by a simple and artificial means.

We find when stock are fed liberally on an immature tap-rooted crop, such as mangolds, interference with the digestion and health of the animal follows, and the quality of the milk is affected.

That fishiness is usually found when green food is abundant is further proved when we consider its prevalence throughout the past export season, when the rainfall in many dairying districts was above the average, and the rush in plant growth quick and unstable. Again, it is not impossible that some species of weeds possessed with injurious properties might develop in their initial stage of growth certain constituents favorable to the presence of fishiness. In milk we can detect strong flavors of the wild mustard, turnip, and marshmallow, and in some districts the manufacture of both butter and cheese gives rise to difficulties peculiar to the district, and which can be attributed to the quality of the herbage.

The milk of freshly-calved cows appears to retain a food taint, and to this it might appear that fishiness is intensified in the months already mentioned, when the majority of milking stock are unfortunately coming in. It is not uncommon to find that the milk of some freshly-calved cows is quite offensive up to fourteen days from the birth of the calf, and not essentially in the winter months; hence what can it be when animals are feeding on weeds and other species of plants growing in abundance in the flush of the season. In connection with the test which is to follow it is noteworthy that five of the nine factories whose butters were fishy traces of newly-calved cow's milk were found in the separator bowls. Bacteriological examinations confirmed this information received from the factory managers competing. Before giving what has been notified as interesting information on the question of fishiness it will be well to point out that the organisation of the Government factory butter test was not done with a view to find out the cause of the trouble, but was instituted in order to ascertain the faults in treatment from the time the milk was received at the factory until the butter was dispatched to the freezing chambers. Publicity has been given to the results of the test in a past number of the *Journal of Agriculture*.

The following table records the hours of ripening, also the flavor of the butter manufactured under the headings of "Fishy" and "Sweet," together with the conditions of growth of the feed in the different districts:—

Fishy Butter.

	Flavor.	Hours of Ripening.	Growth of Feed in District.
1.	Very strong fishy	48	Rank
2.	Strong fishy	72	"
3.	"	48	"
4.	"	24	"
5.	Full fishy	60	"
6.	"	30	Partially matured
7.	Light fishy	53	Rank
8.	Fishy	45	"
9.	Strong fishy flavor	20	"
	Sweet Butter.		
10.	Good flavor	26	Partially matured
11.	Sweet	28	"
12.	"	20	"
13.	"	14	"
14.	"	Speedily churned	"
15.	"	"	"
16.	Good flavor	51	"
17.	"	48	"

From the above it will be observed that the fishy butters were manufactured from the old creams, and it is worthy of notice that in eight cases out of ten the growth of the herbage was of a rank and immature description. The opposite is seen in the case of the sweet butters.

No. 9 of the fishy lot shows twenty hours for cream ripening, but this is accounted for owing to a starter having been added.

No. 16 had the cream preserved in salt before churning, hence the delay of fifty-one hours in ripening, and No. 17 was pasteurised.

Following on the lines laid down by dairy bacteriology, one would naturally think that a high degree of lactic acid would have arrested the development of fishiness if a special organism was the cause of it. If it be from the direct action of an organism, in all probability an extensive period of ripening and an acid media is favorable to its growth.

An examination of the fishy butters for an alkaline and acid reaction showed that the sweet butter favored the alkaline test, and with all the fishy samples taken strong acid reactions followed. An acid flavor in the fishy butters prior to refrigeration was very evident.

Award of Points Before and After Refrigeration.

When the butters were examined at the depôt I made a careful examination of each lot, choosing forty points as the maximum for flavor. Mr. Simpson, from Melbourne, who made the final test, took fifty as his standard.

The accompanying table gives the result, the numbers of which correspond with the first table or fishy butter.

Fishy Butter.

No. of Lot.	First Examination. Maximum for Flavor, 40.		Second Examination.	Difference Between Points Awarded.	
	Points Awarded.	Equivalent at 50 points for Flavor to	Maximum fo. Flavor, 50.		
1	32	40	33	7	Feed rank
2	35	43¾	35	8¾	
3	35	43¾	35	8¾	
4	30	37½	35	2½	
5	30	37½	37	½	
6	30	37½	37	½	
7	34	42½	38	4½	
8	38	47½	37	10½	Feed rank
9	36	45	35	10	

When the first examination of the butter took place fishiness was barely in evidence, although the majority of the consignments were a week old. In the case of the bracketed butter the quality was good, more especially Nos. 8 and 9, both samples being entirely free from the slightest taste of a foreign flavor. After refrigeration quite a different change took place, as will be seen from the points awarded at second examination.

Fishiness developed throughout the period of chilling, which extended to seven weeks; and at the close of that time the boxes were removed to a cool corridor for five or six days, when the temperature averaged 58° F., and the butter was then examined by Mr. Simpson, when fishiness was noted to be very pronounced.

Again, assuming that a germ is directly accountable for it, a freezing temperature may prove fatal to its existence, and the products previously established may undergo a chemical change, or the germ itself is able to continue its life, and be favored by a freezing temperature.

Bacteriological Purity of Milks and Water.

Forty-eight analyses were made of the whole milk and of separator and buttermilks, and also of the water used in the washing of the butter. The examinations were entrusted to Dr. D. McDonald, of the Adelaide Hospital. From the analyses a number bore evidence of the pus group of germs, but none represented any serious taint. It should be added, however, that no special search for any germ that might possibly cause fishiness was made. The number of germs per c.c. and ten micro-millimetres were determined, together with the species found foreign to dairy produce. The summing up of the examinations, as given in the following table, is based upon the purity of the milks from injurious germs, not from the number of organisms found:—

Fishy Butter.

No.	Whole Milk.	Separator.	Butter Milk.	Water.	Well or Rain.
1.	Fair	Low	Good	Low	Well
2.	Extra good	Good	Fair	Good	Well
3.	Low (strepto and staphylococci)	Low	—	Low	Well
4.	Very good	Good	Good	Good	Rain
5.	Fair	Low (pus and staphylococci)	Very low (blood cells, pus, and staphylococci)	Low	Well
6.	Low	—	Low	Very low	Well
7.	Good	Good	Good	Low	Well
8.	Low	Very low (pus and yeast cells and staphylococci)	Good	Very low	Well
9.	Good	Good	Fair (blood cells)	Extra good	Rain
			Sweet Butter.		
10.	—	—	—	—	—
11.	—	—	—	—	—
12.	Good	Good	Very good	Low	Well
13.	Fair	Fair	Very good	Extra good	Rain
14.	—	—	Good	Fair	Reservoir
15.	—	—	Good	Fair	Reservoir
16.	Very good	Very good	Very good	Low	Rain
17.	Good	Good	Good	Fair	Rain

It will be observed that Nos. 2, 7, and 9, "fishy butter," show a good analysis, with No. 4 especially good; still in three of the four instances the butter manufactured was "strong" in the fishy flavor.

All the butters were from parts in the colony where the herbage was the rankest of all the districts at the time of the competition.

In the case of the good keeping, or "sweet," butter the general analysis is high, but unfortunately a complete examination could not be made owing to some samples arriving too late. Nos. 10 and 11 were totally unfit for any examination.

Salt.—The best brands of salt were used in nearly all the samples, and three out of the four prize lots had the butter grains bruised in the churn following washing. Throughout the test there was no evidence to show that fishiness was brought on or was increased by the influence of salt. No. 16, which shows the best analysis of all, was awarded the first prize, and the cream used in the manufacture of the butter was salted.

Preservatives.—The quantity of preservative added to the four prize butters was as follows:—First prize butter, 10ozs. preservitas to 168lbs. butter; second prize, 12ozs. preservitas; one of the third prize butters received about 14ozs. "preservaline," and the other had no preservative other than common salt added.

Four of the fishy butters (Nos. 1, 3, 4, and 6) had no preservatives added except common salt; hence it will be noticed that the judicious use of a preservative is conducive to a keeping quality.

BOT, WARBLE, AND GAD FLIES.

In the February issue of this journal Mr. J. G. O. Tepper, F.L.S, F.S.Sc., described the general characteristics of the flies known as "botflies," "gadflies," and "breezeflies," and made reference to the capture at Echunga of a fly similar in appearance to the European gadfly. Mr. Tepper referred to the indiscriminate use of the above names to different species, and the consequent confusion that has arisen therefrom. He stated that bot or warble flies were those whose maggots infest the skin of animals, causing swellings, called bots; that gadflies where those whose maggots infested the stomach of the horse, and breezeflies those infesting the cavities of the nose and throat of sheep and other animals.

As scientific authorities in other parts frequently referred to the maggots found in the stomach of horses as "bots," the Editor wrote to the Agent-General in London for South Australia and to Miss E. A. Ormerod, the well-known authority on entomology, and has received through the Agent-General a letter to the following effect:—

Probably in South Australia, as with us, it will be quite impossible to get people to call these flies (*i.e.*, botflies, warbleflies, and gadflies) by their right names, but this is the distinction between them: *Gadflies* (Tabanidæ) are bloodsuckers, and possess a sort of "gad" or pointed apparatus of lancet-like mouth parts which they drive into man or beast. Their maggots live in the ground. *Warble or bot flies* (Œstridæ) are one and the same in nature; they are characterised by the mouth divisions being almost obsolete, and their maggots feed in the hide, nostrils, throat, or other parts of animals. The term "warblefly" is popularly applied to those which feed in the hides (in the maggot stage) of cattle and deer; the term "botfly" to those that are *internal* feeders. Thus the horse botfly (Gastrophilus equi) feeds in the stomach, the horse warblefly in the hide.

From Miss Ormerod's letter it is evident that the fly, the maggots of which have been so troublesome in the stomach of horses in Victoria, and which has recently been found in the South-East, is correctly described as the horse botfly. The Agent-General has also forwarded specimens of the ox warblefly, the horse botfly, and of gadflies, and these can be seen by anyone interested at the office of the Agricultural Bureau.

Scab in Great Britain.—Precautions against the introduction of scab in sheep from Great Britain appear quite necessary from the official reports of the Agricultural Department. During the month of January, 1900, scab existed in thirty-four counties in England, in twelve in Wales, and sixteen in Scotland; and fresh outbreaks in fifty-eight counties during the month. It seems strange that so little progress is made in eradicating scab from sheep. Simple precautions and two careful dippings should go far to reduce the number within reasonable bounds. Restrictions preventing the removal of infected sheep in districts without their being first dipped would have a salutary effect.

THE FARMER'S LIVE STOCK, INCLUDING HIS WIFE.

The following remarks do not apply to any farmer in South Australia, although in the early days of this colony the writer saw a cow, a pony, and a woman drawing a plough, whilst the man held the handles, and found it hard work, as it was one of the ancient, clumsy, wooden sort, which was liable to throw the ploughman over its back amongst the team. The woman was a fit helpmeet for her husband—strong, healthy, and willing—but she doubtlessly did more than her fair share of the work on the farm :—

There is a country—in Nomansland—where the farmers are not so considerate for the comfort and health of their wives and daughters as for that of their farm live stock. The pigs must be fed regularly, have their styes attended to frequently, and all they have to do in return is to lie down in the warm straw, eat, drink, and grow fat. The cows must never be worried or hurried ; but they are comfortably housed, fed upon food that they like, and are petted and looked after with the most solicitous care. The only live stock that are neglected and despised are the fowls, ducks, and geese, and these belong to the womenfolk. The farmer curses the hens because they fly upon the stack and spoil the hay intended for the horses, whilst lurid language assails the ducks and geese because they befoul the waterholes and eat the green grass and yet the farmer shares in the comforts purchased for the home with the proceeds from the sale of the eggs and young birds, whilst begrudging the refuse which supports the poultry.

The farmer's wife gets out of bed before anyone else to prepare the breakfast, whilst the husband goes off to the stables to feed and groom the horses. After the meal is over the husband and horses go on to the field and do a little work, whilst the wife washes up the dishes, sweeps the rooms, dusts the furniture, makes the beds, prepares the dinner, and does a little washing and ironing of clothes, with some mending and making to fill up gaps of leisure. She milked the cows whilst the kettle was boiling for breakfast, and between breakfast and dinner sets the milk, skims the cream from that set yesterday, washes up things in the dairy, churns and makes the butter, feeds the fowls (and sometimes the pigs and calves), probably chops a little wood, attends to the garden, and so on *ad infinitum*. At midday the poor tired farmer comes in from the field with his team, which must be watered, fed, and rested, and then he comes in and lies on the sofa until dinner is ready. After dinner he has a quiet smoke while the wife clears away the table, washes up, and amuses herself with the housework. At 2 o'clock or later the team and the husband go out to the fields again and work till dusk, whilst the wife stays at home doing a little mending and making whilst looking after the cooking of the evening's meal. The husband comes in between 5 and 6 o'clock with the team, feeds and grooms them, and the horses have done work for the day. The wife has milked the cows, fed the fowls, pigs, and calves, and has the table laid out tastefully to tempt the appetite of her "lord and master." He sits down, and the wife is happy if he does not grumble at the food, whilst she flows over with joy if he has a few words of praise and commendation. After "tea" is over the man takes his pipe and newspaper or book, while the wife clears away and washes up. When this is done she may sit down and do some sewing or making of clothes—or do some other work that must be done. If the farmer learns of an implement or tool that will lighten his labors he gets it. If the wife knows of something that will add to her comfort or lighten her work she goes without it. If laborers are engaged they get their weekly pay regularly—or the "boss" soon finds out all about it; but if the wife requires a few shillings for the purchase of a new bonnet or gown, she may still ask again and again for the money—and still want it. If there are children about the house--and, fortunately for the poor woman, there are generally several to claim her love—the work is enormously increased. If the farmer has had a good season he will probably purchase a buggy for himself, or maybe a new riding plough; but if the wife asks him to dig a flower garden for her he will tell her to do without the luxury. Surely "the laborer is worthy of his hire." Why, then, should not the wife of the farmer in that far-off country have the greatest consideration paid her? Why should she have to beg again and again for a little money to pay for the useful articles she requires to lighten her labors, to cheer her life, or even to gratify the little vanities which may or may not be inherent in the feminine nature? It is not for an instant to be supposed that any farmer in South Australia treats his wife or his daughters with less consideration than he shows for his farm live stock; but we can all sympathise with these poor women in Nomansland who work sixteen or eighteen hours every day of the year, and are compelled to beg and pray for a little money to purchase necessaries for the home, clothes for the children or themselves, and who seldom or never get "a day off," whilst their "worser halves" go to races, political bear-fights, sellings-up by auction of their neighbors' stock. and all other amusements.

DEEP OR SHALLOW PLOUGHING?

The principal aim and object of ploughing is to get the ground into a suitable condition to receive the seed and to promote the growth of the cultivated plants. If the question were put to all farmers. "Whether is it best to cultivate the land deeply or otherwise?" the diversity of opinion would be somewhat bewildering; but were the same question put to the whole of the gardeners on the face of the globe there would be but one answer, "Deep and thorough working of the soil is the only way to attain success." The farmer who does not favor deep cultivation for wheat will furnish a dozen strong reasons why he should not follow the practice adopted by gardeners. He will say, *inter alia*, that the gardener's operations are entirely different from those requisite for the growth of cereal crops: that the gardener always picks out an especially good piece of land, and uses a lot of manure and water, which is quite true. It would be absurd to devote the same amount of cultivation to the wheat crop that is necessary for the growth of cabbage and potatoes. The wheat plant requires a treatment entirely different from that of root crops. It is true, nevertheless, that the cause of light and unprofitable wheat yields is nearly always traceable to shallow and insufficient tillage. There is a possibility of bestowing too little as well as too much labor and expense in the cultivation of any kind of crop, and the limit that can be profitably expended in growing wheat depends very largely on the character of the soil and rainfall of particular districts. There are circumstances which make it impossible to plough deeply, or even to subsoil, or to stir and pulverise it, in some places. Upon the thin soils super-imposed upon limestone crust it would be a mistake, probably, to break up that crust and to stir up the loose nodules of limestone beneath. This might do for the planting of vines and fruit trees, perhaps, but certainly would be ruinous to the prospects of a wheat crop. Again, where the compact marl, or brittle, brick-like red marly clay exists beneath a sandy clay, such as is found overlying many marly clays, it would never pay to turn these unfertile sub-soils up to the surface; but there is no doubt that if these subsoils could be thoroughly broken up fine (not in lumps by any means), and left in the original position, there would be a very great improvement in the crops raised upon such lands. It is in bringing these intractable clays to the surface, or in breaking them into coarse clods beneath, that mistakes are often made. With clods beneath it is made possible for the moisture to be extracted from the soil above during summer. and for the water to collect in winter, to the ruination of the plants in either case. The gardener turns his soil up, and breaks every clod from bottom to surface. The farmer too often merely turns the furrow over—often when the soil is too wet or too dry—and the result is that the sub-soil, or the portion on top of the sub-soil, is a mass of clods and hollow spaces, so that the wheat plant does not get a fair chance to develop properly. The advantages of deep ploughing are that it exposes more soil to the action of light, air, and moisture; affords more space for the roots of plants; produces many of the beneficial effects of draining; preserves from the evil consequences of both drought and rain; and produces much heavier crops than can be raised by shallow ploughing.—*Border Watch.*

CODLIN MOTH REGULATIONS.

REGULATIONS UNDER THE VINE, FRUIT, AND VEGETABLE PROTECTION ACT, 1885, FOR THE DESTRUCTION OF THE CODLIN MOTH.

1. In these regulations, unless some other meaning is clearly intended—

"Codlin moth" means the insect known as the *Carpocapsa pomonella*, or codlin moth, in any stage of its existence:

"Garden" means any land whereon any apple, pear, or quince tree is growing, and includes the whole of the land within the same enclosure, and if not enclosed shall include the whole of the section, block, or allotment on which any such tree is growing:

"Inspector" means an inspector under the Vine, Fruit, and Vegetable Protection Act, 1885:

"Tree" means any apple, pear, or quince tree.

2. If any inspector shall be of opinion, after inspecting any garden in which any tree is growing, that any such tree is affected by the codlin moth, he shall serve notice on the person in occupation or possession of such garden that such garden is affected with the codlin moth.

3. Such garden shall, upon service of the notice, be deemed affected with the codlin moth, and shall be deemed to continue to be so affected until an inspector shall give notice that it is free from codlin moth.

4. Service of any notice under these regulations may be made by sending the notice by registered letter through the post to the person in occupation or possession of the garden, addressed to him at his usual place of abode, or by leaving the same with any person in the garden, or by personal service.

5. So long as any garden is deemed to be affected with codlin moth the person in occupation or possession of such garden shall do the following acts:—

I. In each year, between the 1st day of June and the 1st day of September, or at such other times as the inspector shall direct, scrape off all rough dead bark from the trunks and limbs of every tree growing in the affected garden, and clean out all crevices in every such tree into or on to bagging, or other suitable material, and shall destroy all such scrapings and cleanings by fire.

II. In each year, between the 1st and 31st days of October, or at such other times as an inspector may direct, fasten a band of suitable material with two folds around the trunk of each tree growing in such affected garden, or around each branch thereof near to its junction with the tree, each fold to be not less than 4in. in width, and (*a*) after fastening each such band, and until the same is finally removed, unfasten, examine, and replace such band every seventh day, and destroy all larvæ and pupæ therein: (*b*) Between the 1st day of June and the 31st day of July, or at any other time an inspector may direct, finally remove each such band and cleanse or destroy it in such a manner as an inspector shall order: (*c*) At such times as an inspector shall direct smoothen the soil under and near each tree, and keep such soil clear of all foreign matter which, in the opinion of an inspector, might prove a shelter or harbor for the codlin moth.

III. Gather from each tree all fruit affected by the codlin moth whenever directed by an inspector so to do, and gather weekly all fruit affected by the codlin moth that shall fall from any tree growing in such affected garden, and destroy such fruit or treat the same in a manner approved of by an inspector so that all larvæ therein or thereon shall be destroyed.

6. No fruit affected by the codlin moth shall be removed from any garden (whether declared to be affected with the codlin moth or not) without the written permission of an inspector.

7. Any inspector may give written permission to the occupier of any garden affected with the codlin moth to remove any fruit affected by the codlin moth from such garden and sell the same if all codlin moths therein or thereon have been destroyed, subject to the following conditions, namely:—

(*a*) Such fruit shall only be sold to a manufacturer or person named in the permission:

(*b*) All packages containing such fruit shall be branded in such manner as the inspector shall direct.

8. Where any garden is declared affected with codlin moth after the 31st day of October and before the 1st day of June in any year, the person in occupation or possession of the garden shall, within seven days after the receipt of the notice, scrape off the rough dead bark from the trunks and limbs, and clean all crevices in the bark and forks of every tree growing therein, and fasten a band on each such tree, in manner provided by sub-sections I. and II. of section 5 of these regulations.

9. Any inspector may direct the person in occupation or possession of any garden affected with codlin moth to scrape the rough dead bark off, fasten a band on, and otherwise treat any other tree which an inspector may deem to be a harbor or shelter for codlin moth growing in the said garden, in the same manner as apple, pear, and quince trees, and such person shall comply with such direction.

10. Any person in occupation or possession of any garden deemed to be affected with codlin moth who shall fail to comply with these regulations shall be liable to a penalty of not exceeding fifty pounds.

11. All lands the reputed owners or persons in occupation or possession of which shall have received notice under any regulations heretofore made under the Vine, Fruit, and Vegetable Protection Act, 1885, that such lands are affected or are declared infested with the codlin moth shall, for the purposes of these regulations, be deemed to be gardens affected with the codlin moth, and to continue to be so until declared free from codlin moth by an inspector.

12. The regulations under the said Act for the destruction of the codlin moth, made by proclamation published in the *Government Gazette* on the 1st day of July, 1897, are hereby repealed.

NOTES ON VEGETABLE-GROWING FOR MAY.

By George Quinn, Horticultural Instructor.

On the plains country the weather continues highly favorable to the growth of vegetables. All kinds of vegetables are growing freely, and the fork or hoe should be used frequently between the rows to keep down weeds and stimulate root action by aerating and warming the soil.

Quickly soluble manures, such as superphosphate, sulphate of ammonia, and nitrate of soda, can be used with good effects upon the growing plants (except peas and beans, when using the two last named). These should be sprinkled along between the drills just prior to hoeing or forking the surface.

The thinning of crops of carrot, parsnip, turnip, swede, beet, and radish should be closely adhered to. Most amateurs fall into the error of not thinning these crops sufficiently. The ultimate size of both top and bottom must be reckoned upon when performing this operation. The operator must not forget that the top requires room to grow, and sufficient light must be permitted to pass through the foliage to ensure proper growth. Turnips require, roughly speaking, at least 9in. square to the individual plant to fully develop; carrots and parsnips require at least half this area to each plant, and red beets a little more than carrots or parsnips.

Potato crops should be mounded up where time cannot be found to stir the soil between the rows frequently, and the first course is usually followed probably more from its easy application than its superiority as far as production of tubers is concerned.

Prickly spinach should not be allowed to grow into large plants before beginning to utilise the foliage. As soon af the leaves reach the size of the palm of one's hand a start should be made to pluck them for boiling.

If the seeds are ripening or the stalks yellowed upon the asparagus plants the stems should be cut away and a dressing of farmyard manure placed over the surface.

Rhubarb beds—not winter varieties—may also receive a dressing of similar manure.

Celery should be earthed up from time to time to blanch the leaf stalks throughout their full length. Liquid manure, made by steeping fresh sheep or cow manure sunk in a tank of water, will stimulate the growth of these plants.

Transplantings of cabbage, cauliflower, broccoli, kohlrabi, celery, onions, lettuce, &c., should be made on the plains.

Sowings should be made in prepared beds of cabbage, cauliflower, lettuce, and onion, and in drills in the open beds of broad beans, parsnip, carrot, prickly spinach. It is very little use sowing peas just now on the plains, but former lots should be staked carefully.

All vegetable refuse, such as haulms of peas, beans, tomatoes, melons, &c., should be thrown into a pit to decay, and in fact all kinds of weeds and path scrapings should be treated in this manner and afterwards composted with manure, sand, &c., for manurial purposes. All diseased parts should be burned.

Very heavy clay soils should be treated with lime at the rate of about 14lbs. per rod. This should be spread over the roughened surface and left to penetrate.

Garden ground unused should be dug up and left in a rough state for the time being.

LIST OF SUMMER AND EARLY AUTUMN EATING APPLES IN ORDER OF RIPENING.

By G. R. Laffer, Belair.

Early Margaret, Red Astrachan, Mr. Gladstone.—All very early, ripening from about December 20 to January 10 All good appearance; the last named is the best quality. They require gathering every few days, otherwise they fall,

Irish Peach.—Ripe about second week in January. Very good quality; tree blight proof.

Williams's Favorite.—Ripening from about January 20 to February 1. Good appearance; quality fair.

Lady Sudeley, Chenango Strawberry.—Ripe about first week in February. Both good appearance and fair quality.

Gravenstein.—Ripe from first week to February 20; one of the best quality apples grown; requires frequent picking over, as they color up; will keep in good order several weeks after gathering.

Ribston Pippin.—The first apple we have suitable for shipping; ready to gather from trees about second week in February, and will keep in good order for several months; like Gravenstein, wants suitable climate to get best results.

American Mother.—A really good quality apple, ripening about March 1; tree regular and good bearer.

Pomme de Neige.—Ripe about first week in March; good quality, good appearance, and regular bearer.

Jonathan.—Ripe about first week in March; probably the best apple we have in its season; quality and appearance first class.

ORCHARD NOTES FOR MAY.

By George Quinn, Horticultural Instructor.

The fruit harvest, as far as the deciduous kinds are concerned, will end with this month.

The time has now arrived for the observant grower to sum up the results of the season's work, to review the characteristics of each kind of fruit grown in his orchard, and the behavior of every variety under the conditions prevailing in that particular locality.

With the accurate data which constant oversight furnishes to the energetic grower, he should be in a position to decide with a fair amount of certainty whether the cultivation of any particular kind, or variety of a kind, is worth prosecuting further.

In making a review of this nature due allowance should be made for any exceptional conditions that may have arisen within the period under consideration.

Some of our choicest fruits have very great defects under certain climatic effects. The very excellent Strawberry Pippin apple this year has displayed its weakness quite conspicuously by cracking in a ruinous manner after the autumn rains. Some of our most enterprising growers have this season lost large quantities of these apples owing to this defect, and express their intention of grafting all of them to other kinds during the coming season. This may be wise, but the other excellent qualities possessed by this variety, and the rare occurrence of sufficient rain in autumn to reveal this one defect, provide reasonable grounds for further consideration before decisive action is taken.

Instances of this sort might be multiplied greatly, but it is well to take a full all-round review of any kind possessing well-known qualities before discarding it.

Another point worthy of mature thought in such matters is the successional ripening qualities of different varieties. The grower who watches the market, noting its periods of scarcity and abundant supplies, will unfold a field for enterprise and thought. Nearly every fruit-growing district in this colony owns some peculiarity in this respect, were information only available to growers therein. In these days of specialising success would appear to depend not so much upon producing everything which the locality will grow generally as upon growing that which is peculiar to the district.

In some parts the brown pitting beneath the skins of the apples is somewhat prevalent this season, and in storing care should be taken to keep those kinds subject to this defect well in sight. Cleopatra, Esopus Spitzenberg, Scarlet Nonpareil, Northern Spy, all well-known and highly-esteemed varieties for storing, are particularly susceptible to it. The exact cause has not yet been determined, but in this colony there is a general impression that it is most prevalent upon these trees when the growth is vigorous and the fruits above average sizes, trees that have made strong shoots after severe pruning or during the first years of fruition while yet growing strongly, or if old trees have been stimulated by unusual supplies of moisture during the summer period.

In some parts a hailstorm caught the apples when half grown, and a lot of specimens with sunken spots are now found. These sunken spots, when opened, conceal a brown, dry, dead patch of tissue. Such specimens should be sold off as soon as convenient, though the expansion of the decay may be very slow under fairly dry storage conditions; still in a damp storeroom it is more hurried.

Anyone ploughing or digging in an orchard at present cannot fail to note the differences in the physical condition of the soil where it has remained broken and where the surface has been trodden or beaten down by natural or human agencies. In the former the rain has penetrated to the subsoil, and the top soil is, where not too clayey, in perfect condition. In the latter it turns up in huge lumps (unless very sandy), which will take almost the whole winter season to break down. The liberation of plant food in the former, and its reduction to an available form through natural processes, would appear very great indeed, and worthy of careful observation.

The first ploughing or digging should be done now; and unless the orchard is old and the roots close to the surface the plough should go in about 8in. This does not apply to the immediate vicinity of the stems of the trees. The fork should go in at least a couple of inches deeper in small gardens, and the breaking of a few roots need not frighten the beginner. The soil should be left in a rough state, and not pulverised. In parts where the rainfall is limited every advantage in the way of diverting running surface water from surrounding road ditches, &c., into the orchard should be taken. Citrus fruits without perfect under drainage will resent this, but not otherwise.

The planting of deciduous trees in localities approximating to the conditions prevailing on the Adelaide plains should be carried out during May, as soon as the sap in the trees in the nursery ceases to flow.

Contrary to the usually accepted belief, deciduous trees here make root growth while the tops are apparently dormant. The early-planted trees thus become established by the time the young shoots emerge in spring, and obtain a fair root hold before the full drought of summer has arrived.

If the intending planter wishes to secure good healthy stock—and any other policy is suicidal—he should place his order with a good nurseryman in the early autumn, and lose no time in securing his trees when the period of planting arrives.

I wish to again warn the beginner against the delusion that a large nursery tree has any superior value; and above all avoid old gnarled stock which has been kept over from season to season in the nursery. A young yearling tree with a single stem, furnished with plump buds and smooth bright bark, is best. The grower can then cut the stem to set the trunk the height he desires.

In the May issue last year a selected list of fruit, set out in their order of maturity, was published. These are still standard sorts, though other good kinds should be tested in every locality.

In early districts the pruning of plum trees can be safely undertaken during this month.

The application of slowly-dissolving bonedust should be made with the first ploughing referred to herein, and stable manure can be applied at the same time of the year.

The ties should be cut away from budded stock now, and the top growth of the stock still left in its natural state.

The bandages around apple and pear trees should be carefully examined several weeks after all the fruit has been harvested to destroy stray caterpillars of codlin moth; in fact they could be removed altogether and disinfected by being put in boiling water, afterwards dried and preserved for future use if sound, but if rotting they should be taken from the trees and burnt immediately.

POULTRY NOTES.

By D. F. Laurie.

The recent grand rains are infusing new life into our producers, and doubtless there is a general intention of making up for lost time. To put all one's eggs into one basket is to tempt Providence. It has been the aim of many to point to the profits which will accrue from the development of the minor industries. Of all these there is none which so readily lends itself to varying circumstances as the poultry industry. With such suitable surroundings and climate, coupled with an assured profitable outlet, it is marvellous that this industry is so neglected. It may be safely said that the greatest enemies to successful poultry-breeding are those self-sufficient men who, while just able to distinguish a goose from a peacock, air their views on all occasions, and these they ram down the throats of unsuspecting novices. The days of experiment have to a great extent departed. Accumulated experience has taught us so much that if we only go on these ascertained lines we shall prosper. We have the advantage of knowing exactly the requirements of the English market, and the leading breeders and specialists in England and Australia have taught the most approved methods of feeding and rearing. Many have taken advantage of what has been published, but those who recognise the importance of the subject are in a vast minority. The aim is to induce the general producer to augment his means in a simple and pleasant manner. Most readers have heard of the enormous sum of money, totalling over five millions sterling, which England spends annually in the egg and poultry trade. This is a subject that is now occupying the attention of many thoughtful people in the old country. Special reports have been published, and many societies have been founded, with more or less success, for advancing the minor industries and especially that for poultry. One of the most recent of these societies is the National Poultry Organisation of England, of which Lady Cranbourne is the president. The aim of this society is to induce the British farmer to pay more attention to poultry and egg production, so that a considerable portion of the vast sum annually spent may be kept in the country. We in Australia have a just right to supply the needs of the mother country. Turkey-breeding is a most profitable undertaking if conducted on sound lines; country and climate are alike well suited and the profits are great.

At this season of the year, just after the first rains, it is usual to hear of numerous cases of disease among poultry. Accumulated filth is answerable for the greater number of cases. In the country it is unfortunately the practice to deposit all the filth, &c., in creeks and waterways, and after a rain much of this obnoxious matter is carried along and redeposited, and very often poultry of all sorts will grub round and consume much deleterious matter, often with fatal results. Hygiene as regards poultry is but little understood; in fact, some people expect their birds to thrive in equally insanitary surroundings to those to which their families are exposed. Numerous cases of poisoning, &c., have been referred to me, and on ascertaining the exact history of each case a large percentage has proved to result from the consumption of putrid meat by the birds. Food of all sorts, if intended for poultry, must be of the best quality. The objects in feeding poultry are specific. We do not aim at satisfying hunger; the endeavor should be to transform a certain amount of suitable food into flesh or eggs. It is frequently stated that the refuse of à farm, such as drake and weed seeds, is excellent feed for pigs and poultry. This, of course, depends to a great extent on the chemical constituents of the refuse in question. If it is deficient in the necessary constituents it is of little value, and if utterly unsound it is a menace to health. The branches of the Agricultural Bureau would exercise a vast amount of good if they could devise a simple means of co-operation in disposing of eggs and poultry. As must be well known to all, the Produce Export Depôt is eminently suited and equipped for the purpose, and extensive additions are in course of actual construction. Much money would find its way into the producers' pocket if a little businesslike sensible co-operation was the rule. In regard to collecting eggs for export there is room for much to be done. There is plenty of money in it, too, for an up-to-date collector. There are hundreds who would readily increase the number of birds kept if they had an assured and profitable outlet. I am convinced that the individual breeder, unless he purchases largely, cannot do much with the export trade. Organised egg and poultry collection, including fattening the latter, offers a good field of enterprise for a businesslike man. Butter factories and others might add to their dividends by combining this with their present undertakings.

Now is the time to purchase fresh breeding stock, I shall be pleased to advise any reader who forwards a stamped envelope for reply.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.

3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with :—
    1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
    2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
    3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
    4. The terms of payment will be ⅕ (one-fifth) on the production of the first 200 tons; the remaining ⅘ (four-fifths) to be paid, ⅕ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. Batchelor, Minister of Agriculture.

FARM HINTS FOR MAY.

By The Editor.

During this month all cereal crops should be got in if possible. The early-maturing varieties should be left till the last, as they would come into bloom too early and be probably caught by frost. If the land is very wet and sloppy delay sowing till this condition is altered; else the soil will form into clods, which will take years to break up, and the seed will be rotted by the excess of water. With early sowings much less seed can with advantage be used than is necessary when the seed is put in late. Each plant of any cereal should occupy at least a square foot of land when fully developed, but where there are from six to twelve plants on that area it is impossible that they can all arrive at their fullest development and maturity. The questions may be asked, "What is the percentage of germinative power in a bushel of seed wheat?" "How many grains are there in a bushel?" and "How many square feet are there in an acre of soil?" These questions have been settled again and again by actual tests and figures, and the results are astounding, but still we continue to sow from ¾bush. to 1¼bush. of wheat per acre. If the soil is too poor to support thin sowing one would think that it would be still less capable of supporting thick sowing.

There remains no doubt whatever that phosphatic manures are highly beneficial to cereal crops. The quickest results are obtained, of course, from the superphosphates, but the bonedusts and basic slags last longer, and heavier applications are therefore necessary. It is without question, too, that heavier dressings than usual with superphosphate will result in crops which will more than pay for the extra quantity used.

Far-seeing farmers are already giving their orders for superphosphates for next year's use. Many farmers have been unable to secure fertilisers for use this season because they sent in their orders too late.

The best way to sow cereals is in drills, even if no manure can be applied; but the depth should not exceed 2in. on most soils. In very many cases it is most beneficial to the crop if it is harrowed whilst growing.

Crops for ensilage would have been better sown last month, but it is by no means too late to sow them now. The greater the variety of nourishing and palatable plants in the silage the better will the animals like and thrive upon it. Vetches, tares, rape, barley, oats, peas, and similar plants can be selected and grown together. It is desirable to have all the plants in flower at one time, and here comes the difficulty—to sow or select the right plants for this end.

Lucern can be drilled or sown now in localities where frost is not likely to cut off the newly-started plants. Deep, light, rich soils, with water below at not more than 12ft., are best suited for lucern. Sow in drills 12in. apart, ½in. deep, on smooth, level, finely-pulverised soil.

Jerusalem artichokes are the tubers grown on the roots of a species of sunflower named Helianthus tuberosus, which grows to a height of 10ft. or 12ft. in rich, friable, moist soil. The tubers should be planted in early spring, wher danger from from frost is over. Plant them in rows 3ft. by 2ft. apart, 4in deep. Keep them free from weeds and frequently cultivated. The yields are heavy, and the tubers are excellent for the table. Pigs are fond of them, and thrive well upon Jerusalem artichokes. Reclaimed peaty lands are suitable for the growth of these tubers; but they will not thrive on poor sandy lands, nor where the soil is shallow.

White mustard and Dwarf Essex rape may still be sown for forage or for seed. It ought to pay to grow seeds of these for sale.

Sow field peas for pigs and other stock. Sheep are very fond of peas, and will pick up every seed dropped in harvesting. The peas should be sown in rows 3ft. apart and not thickly—2bush. will be ample in most cases. Garden peas may probably give even more profitable results if the pods can be gathered early enough to catch the market when prices rule very high.

Prepare land by heavy manuring and deep tillage for sowing with mangolds and beet in July and after. The subsoil should be pulverised and the bulk of the manure put below the furrow.

All seed wheat should be pickled before sowing. The bunt balls should be skimmed off the top of the solution. To enable this to be done the grain should be dropped into a perforated bucket immersed in the pickle. Take care not to return the seed into bags that have not been pickled to destroy the bunt spores, else use new bags that have never contained grain. One pound of pure bluestone will make 8galls. of pickle, which is enough for 16bush. of seed. It is important to know that the pickle is not weakened by steeping the seed in it; if any pickle is left in the tank it does not need any more bluestone. Bluestone dissolves far more quickly at the surface of the tank than at the bottom, therefore suspend it in a bag near the surface.

Loose smut (Ustilago segetum) differs from bunt, often called "stinking smut" (Tilletia caries) in many respects, and is much more difficult to deal with. Loose smut is more generally found on oats and barley than on wheat. The spores do not attach to the grain, as a rule, but fall to the ground, germinate in the soil after a long time, and attack the newly-started cereal plants, grow up within the substance of those plants, and finally invade the seeds of the oats, barley, wheat, &c., when just forming, and, instead of cereal seeds, there are produced innumerable spores (or seeds) of Ustilago segetum (loose smut), which blow away before the main cereal crop is ripe. Bunt spores, on the contrary, become attached to the seeds, principally of wheat, get sown with the wheat, and attack the young plant and develop in the same way as "loose smut," only later.

Black rust (Urocystus oculta) is another species of parasitic fungus, the spores of which most probably lie in the soil for a year or longer before they start life. If there are grasses or other cereals handy the parasites will attack them and produce the effect known as "black rust"; but if neither grasses nor other cereals are adjacent it is probable that the "black rust" will die of starvation.

Very many farmers have proved that rolling the field directly after sowing hastens germination of seed; but, when the plants are up, harrowing with a light harrow greatly advances the growth and tillering of the crop. A few other farmers who have tried these practices have not noticed any beneficial effects following. In such cases further experiments are desirable.

When fallowing land plough deeply on deep, rich alluvium, and if possible stir up the hard pan beneath. Where there is a marly or clay subsoil near the surface it would be ruinous to turn it up on to the surface; but if it can be broken up and pulverised it will be distinctly advantageous to do so. If the subsoil is broken up and left in a lumpy or cloddy condition there will probably be a very poor crop grown on it.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers

During the past month about 2,000 tons of manure have been imported, and there is now but little to arrive. The favorable indications have caused an active demand for fertilisers of various descriptions, and stocks generally are low. The following additional results of analyses by the Agricultural Analyst of Fertilisers, sampled by myself, have been completed:—

Vendor.	Fertiliser.	Water Soluble Phosphate.	Citrate Soluble Phosphate.	Acid Soluble Phosphate.	Nitrogen.	Potash.
Elder, Smith & Co.....	Lawe's mineral super.	38·23*	—	—	—	—
Australasian Implement Company	Do. do. ..	37·76	—	—	-	—
Do.	Shirley's do. ..	37·33	—	—	—	—
Clutterbuck Bros.	Special do. ..	37·76	—	—	—	—
Do.	United alkali do. ..	36·9	—	—	—	—
S A. Farmers' Union ..	Do. do. ..	38·2	—	—	—	—
Geo. Wills & Co.......	Do. do. ..	37·76	—	—	—	—
F. F. Clement	Excelsior bone super.	13·71	13·05	2·16	2·78	—
Excelsior Manure Co. ..	Do. guano super.	9·93	11·68	—	1·38	..
Adelaide Chemical Works	Bone super.	14·73	16·67	6·57	2 9	0·26*
Do. ..	Guano super.	13·13	16·48	6·12	1·04*	—
Do.	Super. B	18·75	10·58	7·32	0·59*	—
Do. ..	Complete manure....	22·12	8·40	7·31	0·64	0·4*
A. R. B. Lucas & Co...	Bally bonedust, No. 3	—	—	54·1	3·68*	—
Do. ..	Do No. 4	—	-	53·87	3·76*	—
Do. ..	Do. No. 5	—	—	40·95	3·21*	—
L. Conrad............	Bonedust	-		45·62	3·66	—
H. Oertel & Co.	Do.	—	—	47·37	3·03	—
Crompton & Son	Do.	—	—	48·24	3·87	—
Do.	Trotter manure......	—	—	27·94	6 18	—
J. C. Ruwoldt & Son ..	Champion bonedust..	—	—	50·97	3·84	—
Excelsior Manure Co...	Bonedust	—	—	40·38	3·23*	—
Penguin Guano Co.....	Guano	—	—	45·19	—	—

* Average of two or more analyses.

PERIODS OF GESTATION.

At the request of several correspondents we republish the following table (from the *Australasian)*, giving the periods of gestation for mares, cows, ewes, and sows:—

Time of Service.	Mares— 340 Days.	Cows— 283 Days.	Ewes— 150 Days.	Sows— 112 Days.
January 1	December 6	October 10	May 30	April 22
“ 6	“ 11	“ 15	June 4	“ 27
“ 11	“ 16	“ 20	“ 9	May 2
“ 16	“ 21	“ 25	“ 14	“ 7
“ 21	“ 26	“ 30	“ 19	“ 12
“ 26	“ 31	November 4	“ 24	“ 17
“ 31	January 5	“ 9	“ 29	“ 22
February 5	“ 10	“ 14	July 4	“ 27
“ 10	“ 15	“ 19	“ 9	June 1
“ 15	“ 20	“ 24	“ 14	“ 6
“ 20	“ 25	“ 29	“ 19	“ 11
“ 25	“ 30	December 4	“ 24	“ 16
March 2	February 4	“ 9	“ 29	“ 21
“ 7	“ 9	“ 14	August 3	“ 26
“ 12	“ 14	“ 19	“ 8	July 1
“ 17	“ 19	“ 24	“ 13	“ 6
“ 22	“ 24	“ 29	“ 18	“ 11
“ 27	March 1	January 3	“ 23	“ 16
April 1	“ 6	“ 8	“ 28	“ 21
“ 6	“ 11	“ 13	September 2	“ 26
“ 11	“ 16	“ 18	“ 7	“ 31
“ 16	“ 21	“ 23	“ 12	August 5
“ 21	“ 26	“ 28	“ 17	“ 10
“ 26	“ 31	February 2	“ 22	“ 15
May 1	April 5	“ 7	“ 27	“ 20
“ 6	“ 10	“ 12	October 2	“ 25
“ 11	“ 15	“ 17	“ 7	“ 30
“ 16	“ 20	“ 22	“ 12	September 4
“ 21	“ 25	“ 27	“ 17	“ 9
“ 26	“ 30	March 4	“ 22	“ 14
“ 31	May 5	“ 9	“ 27	“ 19
June 5	“ 10	“ 14	Novomber 1	“ 24
“ 10	“ 15	“ 19	“ 6	“ 29
“ 15	“ 20	“ 24	“ 11	October 4
“ 20	“ 25	“ 29	“ 16	“ 9
“ 25	“ 30	April 3	“ 21	“ 14
“ 30	June 4	“ 8	“ 26	“ 19
July 5	“ 9	“ 13	December 1	“ 24
“ 10	“ 14	“ 18	“ 6	“ 29
“ 15	“ 19	“ 23	“ 11	November 3
“ 20	“ 24	“ 28	“ 16	“ 8
“ 25	“ 29	May 3	“ 21	“ 13
“ 30	July 4	“ 8	“ 26	“ 18
August 4	“ 9	“ 13	“ 31	“ 23
“ 9	“ 14	“ 18	January 5	“ 28
“ 14	“ 19	“ 23	“ 10	December 3
“ 19	“ 24	“ 28	“ 15	“ 8
“ 24	“ 29	June 2	“ 20	“ 13
“ 29	August 3	“ 9	“ 25	“ 18
September 3	“ 8	“ 12	“ 30	“ 23
“ 8	“ 13	“ 17	February 4	“ 28
“ 13	“ 18	“ 22	“ 9	January 2
“ 18	“ 23	“ 27	“ 14	“ 7
“ 23	“ 28	July 2	“ 19	“ 12

PERIODS OF GESTATION—*Continued.*

Time of Service.	Mares— 340 Days.	Cows— 283 Days.	Ewes— 150 Days.	Sows— 112 Days.
September 28	September 2	July 7	February 24	January 17
October 3	" 7	" 12	March 1	" 22
" 8	" 12	" 17	" 6	" 27
" 13	" 17	" 22	" 11	February 1
" 11	" 22	" 27	" 16	" 6
" 23	" 27	August 1	" 21	" 11
" 28	October 2	" 6	" 26	" 16
November 2	" 7	" 11	" 31	" 21
" 7	" 12	" 16	April 5	" 26
" 12	" 17	" 21	" 10	March 3
" 17	" 22	" 26	" 15	" 8
" 22	" 27	" 31	" 20	" 13
" 28	November 1	September 5	" 25	" 18
December 2	" 6	" 10	" 30	" 23
" 7	" 11	" 15	May 5	" 28
" 12	" 16	" 20	" 10	April 2
" 17	" 21	" 25	" 15	" 7
" 22	" 26	" 30	" 20	" 12
" 27	December 1	October 5	" 25	" 17
" 31	" 5	" 9	" 29	" 21

WEATHER AND CROP REPORTS.

Amyton.—Weather most favorable for past month. Nice rains on March 29 started feed and many crops. Have had three weeks' showery weather, making total rainfall 1in. Seeding almost completed. Stock in good condition. Prospects for good season—the best for six years.

Arden Vale.—The season has opened well. So far frost has not been experienced. Feed and wheat are growing fast.

Arthurton.—During past month the weather has been cold, showery, and very windy. Seeding operations are in full swing, the weather being favorable to ploughing, &c. Feed is growing well, and stock in a most favorable condition.

Balaklava.—Good soaking rain for month; feed coming on better than for many years past. In stubbles manured last year feed has grown 3in. or 4in., and is in great contrast to that unmanured. Drills are being used everywhere, and some paddocks are quite green. A great increase in quantity of manure used this season. Good feed for lambing season expected.

Baroota Whim.—Best rains for this season experienced since seven years. Feed is high enough for grazing. Seeding in full swing, and earlier-sown crops are already about 3in. high. Stock in fair condition. Sand drifts have caused great damage this year.

Bowhill.—Ploughing and sowing in full swing. Early wheat looking well. Stock generally in good condition. Rainfall for month, 1·61in.

Carrieton.—Up to April 21 weather has been most favorable, grass and early-sown wheat growing well. Good lambing and general season expected. Stock looking fairly good. Rainfall for month, 1·71in.

Crystal Brook.—The weather is most favorable. Rain has been light, but in frequent showers. Feed and early-sown wheat coming on well. Stock in fair condition, and good season expected. Rainfall, 1·80in.

Dawson.—Weather unsatisfactory. Wheat on free loamy soils doing well, but on stiff clay land has not yet started. Weather mild, and many of the early crops are poor, owing to insufficient rain this month. Some wheat that is still underground is malting, while some has shot into leaf. This is all for the worst, as it then rarely gets through the surface. Seeding is about finished, with usual area under crop, and as feed has been more plentiful it has been all as well tilled as can be done in dust and clods. Gardening has been attempted in flooded parts; elsewhere it is impossible to dig more than a few inches deep. Stock fair. Owing to lack of feed dairy cows not as productive as usual. They have been living on dry feed since the hoppers visited district last October

Elbow Hill.—Season opened most favorable. Early sown is well up, and land in good order for ploughing. Seeding in full swing. Expected to be record area under crop this year.

Eudunda.—Weather most favorable for several years. Good season expected, as feed and early-sown crops are growing splendidly. Cattle in splendid condition, although some cows have died from impaction, but this complaint is dying out with the growth of green feed.

Forest Range.—The weather during the last month has been wet, scarcely a day passing without rain ; there have been no floods, and only slight frosts. The apple crop is nearly all gathered in, and has on the whole been fair. The potato crop has been light. There is not a great number of stock in this district, but what there is seem healthy and in good condition.

Gawler River.—The weather during March and April has been very favorable. Feed and weeds on the fallow land, the former making good growth, and in parts there is a good bite for the stock. If crops turn out weedy this year it must be chiefly through neglect to destroy them, for there could not be more favorable weather for doing so. Seeding has commenced ; about the same area as last year will be sown. The fruit crop fairly good, and where not cut by the frosts the grape crop was very good. Summer feed and pie melons were a failure Horses, cattle, and sheep fairly well, and should do better now on account of the early feed. Rainfall for March, 2·19in., and up to date, April, 2·31in.

Gladstone.—Since March 25 we have had between 2in. and 3in. of rain, with intervals of nice warm weather. Feed is growing very fast, and the country generally is quite green. Farmers busy putting in seed, and in places young wheat is already showing up. This season's opening is considered the best since 1890. Nearly every farmer in the district is now provided with a drill, and the amount of money spent on fertilisers this season will be considerable.

Inkerman.—Seeding is in full swing, more manure being used than ever before. Several new drills. Weather suitable, but heavy rain needed, as only a small quantity of water has yet been caught. Feed making fair headway, and sheep are picking up. Horsefeed rather scarce, and some of the teams rather poor. Rainfall for four weeks ending April 25, 1·60in.

Kanmantoo.—Grass started well, and an abundant supply expected. Milch cows improving in milk, and dry cows eating grass in preference to other feed. Ploughing is in full swing. New drills have come into district, and most farmers are purchasing artificial manures for season's tilling. Rainfall for March, 3¾in., which has not been excelled by that month during the last twenty years.

Koolunga.—Season opened splendidly ; best for many years. Good rains have fallen, and grass making rapid growth. Seeding operations proceeding. Drills being used a great deal this year.

Maitland.—The season has opened splendidly. We have had from 4in. to 6in. of rain to date in the different parts of the district. A great deal of land is now sown, and several paddocks are showing crops. The use of the drill and manure is universal. Feed is springing up fast, but sheep, and cattle are very scarce and dear.

Mallala.—The weather has been exceedingly favorable for growth of vegetation. A good deal of the early-sown wheat is up, and grass is growing rapidly. Stock and horses are fairly well. Several cows have died of impaction during the summer, which shows the necessity of providing good succulent food, or other substitutes. Bran and "cocky chaff" have been of great service to many.

Mannum.—We have had about 1in. of rain during April. Feed is starting and there are good prospects of it continuing unless frost comes. Stock generally in fair condition, no disease or complaint of any kind showing. Farmers are busy seeding; a great many are using superphosphates. The rain so far has been too light to enable the heavy lands to be worked, but the light land is receiving all attention.

Meningie.—Have had splendid weather for seven weeks, frequent rains and mild atmosphere. Rainfall for March, 3in., and up to date April, 2·5in. Grass very forward, and two months earlier than for several years. Some crops are up, but generally sowing is only now commencing. Stock healthy and looking well. Fats are fairly scarce, and good store cattle at reasonable prices would find ready sale in about a month's time. Abundance of feed expected.

Millicent.—The weather during the month has been of a most varied character. A few few fine days, at times warm and muggy, heavy rains with hail, and light steady rain ; up to date 2·22in. have fallen. Early green crops coming on well. Not many potatoes dug yet; fair crop expected. Grass as a rule is good, and stock looking well. Cattle and sheep in great demand, and selling freely at high prices.

Minlaton.—During month rain has fallen on a number of days, causing grass to grow vigorously ; weeds have also germinated splendidly on fallow. Farmers are now breaking fresh ground or working fallows by means of paring ploughs or cultivators, and have started sowing wheat. Horses in fair condition ; sheep improving.

Morphett Vale.—The weather since March has been splendid. The rainfall is a record, and no one here remembers such good early grass. Old draught horses are turned out, and fattening on nothing but young grass.

Mount Compass.—Very little frost has been experienced so far. The early rains have given the grass a good start, feed being earlier this year than is usual. Rainfall for month, 4·79in., making a total of 9·9in. since beginning of year.

Mount Pleasant.—Stock generally poor. Grass started well, but more rain wanted. Rainfall for January, February, and March, 0 67in., 0·14in., and 1·75in. respectively.

Mount Remarkable.—Tilling is going on with great vigor. The seed sown before rains growing well, and looks most promising There will soon be abundance of green feed; best prospects of early feed in abundance for the last eleven years. Cattle were getting very low in condition. Some farmers suffered considerable loss; further loss is now happily averted, and stock of all kinds will soon improve in condition. Fruit is about past for this season; a few grapes still remaining; crops have been poor. During the month the weather has been all that could be wished—soft, steady, continuous rain, warm days and nights in between. Rain fell on fourteen days during the month, 4·34in.

Mundoora.—Nice showers of rain have fallen, but not sufficient to catch water. The grass has made a start; many wheat crops are in, but unfortunately the land has to be left in many places until the rubbish makes a start, there not being enough rain last season to make the weeds grow. Farmers are pushing on with all speed, and a large area will be put in with the the drill and fertilisers. Stock in want of more feed; "fats" are very scarce; very little is doing in dairy line.

Murray Bridge.—Have had a fair quantity of rain this month, sufficient to start the grass and weeds—1in. up to date. Seeding operations are in full swing, the greater proportion being put in with the drill; in nearly every case English super. is used. Stubble paddocks where manures were applied last year have first-class feed coming on rapidly. Stock in fair condition.

Nantawarra.—Stock in fair condition. Rainfall for April to date 1·40in., making a total for year 3·59in. As most of the rain has fallen since the beginning of March, the feed is growing nicely, but more rain still is wanted. Most farmers are busy seeding, and the use of the drill and fertilisers is general. A fair show of rubbish is growing on fallow, and farmers have a good chance this year of cleaning their land.

Onetree Hill.—Good soaking rains have fallen, and feed has made rapid growth. Stock are looking well. Rainfall to date 3·30in.; for March 3·03in.

Paskeville.—The weather since early in March has been cool and showery, but the rains have not been heavy enough to put any in the dams, except where catchment is good. A large number of farmers are still carting water. Grass is growing rapidly, and will afford abundant feed for stock, which are in good condition; but "fats" are scarce except where "cocky chaff" was plentiful. Numbers of paddocks are already drilled in with fertilisers, the use of which is now general.

Pine Forest.—Splendid seeding weather. Operations are being pushed forward rapidly, and the early sown has good growth. Feed is scarce; working horses in fair condition. Lambing has commenced in some places, and others should do well, as prospects for good season are favorable. The benefits from manuring are very evident.

Port Germein.—Splendid rain has fallen, being the best for seven years.

Quorn.—The weather for the last month has been all that could be desired; the first fall of rain was 1·41in.; since then light showers, amounting to 0·67in., have fallen, keeping the ground in good working order. This is the earliest and most promising start for many years, and a year of prosperity appears before the farmers, and consequently every one is eager to get in as much as possible. Several seed drills have been introduced into the district, and experiments made with fertilisers, which, if proved beneficial, will be the means of introducing the drill here largely next year. Feed is growing very fast, and if frosts keep away for a few weeks there will be good feed for stock, which generally are in fair condition.

Richman's Creek.—Over 2in. of rain fell at the end of March, and during the present month about ¾ of an inch have fallen in light showers. Feed promises to be more abundant than it has been for the past seven years, and paddocks sown before and immediately after the March rains are looking well.

Scales Bay.—The weather for the past month has been most favorable for the agriculturist and sheepfarmer. Showers have been falling almost daily for the last three weeks. Rainfall for March 2·70in. Farmers are busy ploughing and preparing the land for another crop. The average yield for this district for the harvest 1899-00 was about 4½bush. per acre. Most of the wheat remains at the landing awaiting shipment.

Wilmington.—The finest season experienced since 1888. Continual soaking rains have fallen since the end of March. Early-sown crops are well up. Farmers have good chances of having their crops clean. Owing to dry seasons weeds are plentiful. Herbage expected to be abundant, and will thus increase quantity of ensilage.

Wilson.—The weather has been very disappointing as the rains have been very light with long dry spells between. Very little wheat is up, and there has not been sufficient rain for late-sown wheat, it is expected that much of it will spoil. At present the weather is extremely hot for so late in the year, and no sign of further rains.

Yankalilla.—This season is the best ever known in the district. Feed plentiful, and stock in good condition.

Yorketown.—Good rains. Paddocks already green. Farmers jubilant.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of April, 1900 :—

Adelaide	3·69	Hoyleton	2·27	Macclesfield	4·00
Hawker	0·59	Balaklava	1·72	Meadows	5·29
Cradock	0·44	Port Wakefield	1·73	Strathalbyn	2·82
Wilson	0·44	Saddleworth	3·82	Callington	1·72
Quorn	0·90	Marrabel	4·93	Langhorne's Bridge	1·82
Port Germein	2·36	Riverton	3·83	Milang	2·73
Port Pirie	2·19	Tarlee	3·72	Wallaroo	1·55
Crystal Brook	1·93	Stockport	3·31	Kadina	1·97
Port Broughton	2·21	Hamley Bridge	3·09	Moonta	2·08
Bute	1·78	Kapunda	3·30	Green's Plains	1·49
Hammond	1·03	Freeling	2·49	Maitland	2·40
Bruce	0·70	Stockwell	2·41	Ardrossan	1·93
Wilmington	2·71	Nuriootpa	3·17	Port Victoria	2·10
Melrose	3·72	Angaston	2·93	Curramulka	1·30
Booleroo Centre	2·11	Tanunda	4·01	Minlaton	1·49
Wirrabara	3·44	Lyndoch	3·36	Stansbury	1·56
Appila	2·78	Mallala	2·06	Warooka	1·76
Laura	2·64	Roseworthy	2·23	Yorketown	1·47
Caltowie	2·21	Gawler	3·01	Edithburgh	1·71
Jamestown	2·32	Smithfield	2·40	Fowler's Bay	1·49
Gladstone	3·53	Two Wells	3 05	Streaky Bay	1·56
Georgetown	3·93	Virginia	3·01	Port Elliston	1·67
Narridy	3·38	Salisbury	2·83	Port Lincoln	2·33
Redhill	2·66	Teatree Gully	3·80	Cowell	1·56
Koolunga	2·32	Magill	3·70	Queenscliffe	1·42
Carrieton	0·81	Mitcham	4·20	Port Elliot	2·57
Eurelia	1·40	Crafers	7·66	Goolwa	2·22
Black Rock	1·23	Clarendon	4·95	Meningie	3·00
Orroroo	1·11	Morphett Vale	3·69	Kingston	4·35
Johnburgh	0·47	Noarlunga	2·65	Robe	2·82
Petersburg	1·65	Willunga	3·04	Beachport	3·19
Yongala	2·13	Aldinga	2·63	Bordertown	2·42
Terowie	1·65	Normanville	2·09	Wolseley	2·07
Yarcowie	1·42	Yankalilla	2·56	Frances	2·66
Hallett	2·88	Eudunda	3·02	Naracoorte	2·87
Mount Bryan	2·3[illegible]	Truro	2·58	Lucindale	3·41
Burra	2·53	Mount Pleasant	2·54	Penola	3·72
Snowtown	2·49	Blumberg	2·87	Millicent	3·79
Brinkworth	1·89	Gumeracha	3·94	Mount Gambier	4·19
Blyth	2·12	Lobethal	3·63	Wellington	2·42
Clare	4·54	Woodside	3·54	Murray Bridge	1·67
Mintaro Central	2·12	Hahndorf	4·17	Mannum	0·95
Watervale	4·33	Nairne	3·75	Morgan	1·09
Auburn	3·31	Mount Barker	4·05	Overland Corner	0·86
Manoora	3·31	Echunga	4·29	Renmark	1·01

CIDER "CHAMPAGNE."—Secretary Wilson, of United States Department of Agriculture, recently stated that "thousands of tons of apple parings and cores, as well as dried apples, are shipped abroad every year, and are manufactured into wines which are afterwards imported by the United States. The delicious aroma given to these wines is imparted by a peculiar grade of yeast, which produces fermentation. We have obtained some quantities of this yeast and intend to experiment with it for the purpose of ascertaining whether or not it can be produced here as well as in Europe. We shall manufacture some champagnes and wines, using dried apples as the basis for the product, and giving the bouquet with this foreign-made fermenter. I see no reason why our cider-makers should not be able to supply the rich trade in this country which now gets its supply from France and other European countries, and I believe it will be but a matter of a few years before we will be making as good wine and champagnes as the foreigners."

AGRICULTURAL BUREAU CONFERENCES.

SOUTHERN BRANCHES.

On March 29 the Eighth Conference of Southern Branches of the Agricultural Bureau of South Australia was holden at Strathalbyn. Only seven of the nineteen Branches invited were represented, but there was a good attendance of members and visiting friends. The Hon. J. L. Stirling occupied the chair, and the Hon. E. L. Batchelor (Minister of Agriculture and Education) was present.

Members Present.

For Central Bureau: Messrs. F. E. H. W. Krichauff, Hon. A. W. Sandford, T. B. Robson, Professor Lowrie, A. Molineux, G. Quinn (Horticultural Instructor). Kanmantoo: T. Hair, A. D. Hair, J. Downing. Woodside: R. Caldwell, M.P. Cherry Gardens: R. Gibbins. Meadows: W. Pearson, W. J. Stone. Port Elliot: J. McLeod, W. E. Hargreaves, J. Lovell, J. Davidson, E. Hill. Finniss: T. Collett, J. Collett, W. W. Heath, R. J. Ness, H. Langrehr. Strathalbyn: M. Rankine, Hon. J. L. Stirling, D. Gooch, G. Sissons, H. H. Butler, A. Rankine, W. M. Rankine, W. J. Tucker, John Cheriton.

Exhibits.—By M. Rankine—An excellent collection of apples, grapes, pumpkins, squashes, marrows, tomatoes, dried currants. By R. Caldwell—Mammoth red pumpkin, weighing 98lbs., several apples. By J. Sissons—Marrows and apples. By W. J. Tucker—Pumpkins, grapes, squashes, marrows, tomatoes. By T. Collett—Selected Purple Straw wheat in sheaf, a very superior variety. By W. W. Heath—Very large plants of tobacco, extra selected tomatoes (solid, large, smooth, excellent quality), marrows, pumpkins, squashes, sweet and water melons, &c. By W. E. Hargreaves—An especially fine collection of apples from his new orchard.

Preliminary.

At 10·30 a.m. Mr. John Cheriton, Hon. Secretary of Strathalbyn Branch, and convener of the Conference, welcomed the members and visitors in a very short address, and called upon the Hon. J. L. Stirling to take the chair.

Opening Address.

The Hon. E. L. Batchelor said that he was pleased to open the first Conference it was his privilege to attend. Unlike most of his predecessors, he was not a farmer, but he took great interest in the affairs of agriculturists. South Australia was a producing country pure and simply, so that it must benefit greatly from the work of the Bureaus. As ministerial head of the department under which they worked he would promise that all judicious suggestions from the Bureaus would certainly be given effect to. He was glad that the Produce Depôt was doing just the work for which it was established. It might not be progressing as quickly as some wished, but it was opening up foreign markets which would not have been reached but for its existence. Mr. J. Miller, M.P. for Stanley, had constantly pressed forward the matter of agricultural education. A conference was shortly to be held between members of the council of the School of Mines, the Agricultural College, the Central Bureau, the chairman of the Dairy Board, and officers of the Agricultural Department, which he hoped would have exceedingly good results in securing thorough efficiency and economy of working. He declared the Conference open. (Cheers.)

Subsoils.

Mr. F. E. H. W. **Krichauff**, Chairman of the Central Agricultural Bureau' read a paper, of which the following gives some of the principal points :—

A knowledge of the lower subsoils is of practical value to the cultivator. The physical proportions of the subsoil are of more importance than the chemical, which may be rectified by additions. The subsoil may consist of sand, clay, gravel, marl, lime, humus, or even concrete ; but the sizes of the single grains of these different substances determines mainly their properties with regard to percolation, power to retain water ; and their darker or lighter color controls capacity for absorbing heat. but this latter quality is not so conspicuous in the subsoil as at the surface. The coarse sands and gravels do not favor capillary attraction of moisture from below. Soils composed of fine particles, such as clay, absorb moisture, potash, ammonia, and phosphoric acid, but much less of lime, magnesia, natron, and sulphuric acid, and hardly any nitric acid or chlorine. The water-retaining double silicates, or zeolithes, are of special value. These are combinations of silica with clay, alkaline earths, or alkalies. Where water is too near the surface the soil may be so saturated that air cannot enter with its chemical agencies of oxygen, carbon, and ammonia, nor the micro-organisms which promote oxidation and nitrification—all of which are essential to plant life. Oxide of iron combining with carbon produces concretes through which no roots will penetrate, but lime is almost a universal remedy. Lime neutralises the noxious acids in the cold, wet soil, dissolves other constitutents, and changes ammonia into nitric acid. A sandy soil resting upon a gravelly subsoil is of little value in this climate, where the subsoil should neither be too open or too dense, yet capable to absorb and retain a medium quantity of moisture Stiff clays may hold too much water, even in this colony, and must in such cases be drained. The roots of plants are not produced merely for anchoring purposes—they take up plant food. They ramify the soil in every direction, where this is possible, so that the points of the rootlets come into contact with as much of the soil as possible in order to absorb plant food. In a fairly moist and loose soil they can be pushed forward more easily than in a dry and solid soil. If the roots cannot find air in the soil they will rot through lack of oxygen. For this reason it is necessary to drain and to loosen the soil. With many plants the roots exceed in bulk or extent the whole of the growth above ground, and this shows the necessity to afford every facility for the development and extension of the roots. Although wheat is reckoned to be a shallow-rooting plant, yet it is necessary to loosen the soil (if not naturally loose) to a good depth, for roots of wheat have been traced more than 6ft deep ; and lucern and other legumes go very much deeper, even to 30ft. Such plants leave ducts into the depth of the subsoil, down which air finds its way and surface waters flow. It is well known that legumes derive a deal of nitrogen from the air, that the roots abstract much plant food from the lower depths of the subsoil, and that they enrich the surface soil. Earthworms also improve the soil by opening ducts from the lower strata to the surface, down which the roots of plants can pass, or air and moisture find their way. The pellets of excreta brought to the surface by worms also enrich the surface soil. In time probably all farmers would arrive at the conclusion that deeper cultivation than now practised will be necessary, except in cases where the subsoil is unsuitable. Every one admits that a poor soil is soon exhausted ; a shallow soil is sooner impoverished than a deep one, and a light soil sooner than one that is heavy. A deeper loosening of the soil will hasten the transformation of inert or dormant matter into active plant food.

Mr. **Pearson** always cultivated deeply, turning about an inch of the subsoil each time to the surface and gradually mixing the whole depth together. He had grown the finest of cabbage and cauliflowers on soil so treated.

Mr. **Sissons** said much depended upon the nature of the subsoil, which, if a yellow clay, would spoil the field if turned on to the surface. In such a case, leave the subsoil where it is, but it may be loosened and broken fine with advantage.

Mr. **Krichauff** said in the early days of settlement here he used to trench his vineyard and bring the subsoil to the surface, and the vines did well after some years had elapsed and when the air and sun had sweetened the crude surface ; but if he had left the suboil at the bottom after pulverising it, the work would have been easier and the results better. He had used a good quantity of farmyard manure and mixed it well with the soil from top to bottom, besides digging in more every year.

Mr. **Cheriton** turned over his soil deeply on first arrival in the colony, but found that no crops were yielded for several years. It was a great mistake to turn the raw subsoil on to the surface. Fallowing and deep ploughing of sandy soils were also not to be recommended.

Mr. **Pearson** directed attention to the success achieved by Mr. Ragless, who puts three horses on a single-furrow plough, breaks the land 8in. deep, and gets an average of 2 tons of hay per acre.

Professor **Lowrie** pointed out that everything depended upon the character of the subsoil. On a cold raw subsoil it was easy to make a mistake and and plough too deeply. But while in such cases it was a mistake to dig too deeply at one time, the subsoil should be touched at the top again and again. While he would not recommend as a general practice too deep cultivation, the plan of ploughing one field at a time deeper than the others would enable the farm to be got over gradually, and good results were bound to accrue. (Hear, hear.)

Seed Time.

Professor W. Lowrie, M.A., B.Sc., Principal of the Roseworthy Agricultural College, gave an address as follows:—

He took it for granted that the greater part of the area to be sown during the next few weeks had been fallowed, and the work of seeding was accordingly expedited. One of the most desirable conditions in a seed bed was consolidation, but, of course, this should be conjoint with a good tilth. If the land, whether lately ploughed or fallow, was open and loose, or if the tilth was not well bedded it was desirable to shake it down by cultivating or harrowing. Land might be apparently fine on the top and look a good seed bed, while the plough furrow was nevertheless unbroken and overlying open spaces below. A good cultivator put through this deeply enough tended to shake the tilth down, to break up the lower part of the turned furrow, and to give that desirable homogeniety characteristic of a well-worked seed bed, while two strokes of the harrows would help to consolidation.

If good rains have fallen and the land will work mellowly, the earlier the seeding can be done after April 1 the better, but for this early seeding the land must be clean, and the later varieties of wheat must be used. Early wheats sown early in autumn become proud, and were in danger of being frosted in the early spring. As the seeding season progressed the earlier wheats should be resorted to; the seeding should he made gradually thicker; and the quantity of artificial manure used should be increased. Farmers throughout the colony were now devoting more attention to the variety and quality of their seed wheat, and the manner of putting in the seed, and it was well. He could not understand the *rationale* of the farmer who bought his seed from probably a miller or a wheat merchant, uncertain of the name or variety, or whether it consisted of one kind or of a blend of a number of kinds. An unsuitable selection of varieties for the district might mean a reduction of the average return of as much as a bag per acre, or even more. He, in his experiments with different wheats, had had wheats in the same field, and under exactly similar conditions, varying from 29bush. per acre down to 11bush., according to the suitability to the district and the character of the wheats. It was for every farmer to find out for himself the varieties of wheat which proved most profitable in his country, and to stick to these until better were discovered, selected, or bred. It was so easily done now that the drill was used in seeding, for a few turns with the drill could readily be sown with different wheats. Such tentative work cost little, for if any of them proved unsatisfactory, the small area of each sown made the loss small, and it would enable the farmer very easily to select the best. But careful selection of seed was not everything in the course of improvement; the seed must be thoroughly cleaned, graded, and well blown, so that the lighter, and the smaller and shrivelled grains might be separated from the seed, to be fed to pigs or fowls, or other stock. This, of course, meant extra work, but it was profitable work, and told its tale on the average yields. Pity it was, and pity it was true, that farmers who fallowed their land carefully and worked it well should discount often their yields by "mulling" their efforts by the use of bad seed, or by careless treatment in such operations as the pickling of the seed. His advice was invariably to pickle, and when there was a suspicion of bunt to pickle in a stronger solution of bluestone. The strength of the "pickle" should be from 1lb. to 10galls. of water up to 2lbs. to 10galls., according to the suspicion in the seed of bunt. Seed at all badly bunted was to be avoided altogether, as the pickling necessary to clean it killed some of the wheat and retarded germination.

The best way to put in seed was undoubtedly to drill it, but when a farmer for any reason did not use artificial manures the case was altered. Drilling was slower than broadcasting, and the gain from drilling might not be sufficient to cover the loss from seeding being delayed, say one week. When fertilisers were used everything was in favor of the drill. He recommended farmers not to be too sanguine of the virtue of the exceptionally light dressings which some men thought fit to advise—70lbs. to 80lbs. per acre, for example, of superphosphate. He found in his experimental tests that while the use of 1cwt. per acre returned most money for the outlay, the use of 2cwt. paid handsomely. In comparative tests last year on blocks of land side by side the return from the use of 1cwt. of Lawe's superphosphate was 14bush. 48lbs.;

from the use of 2cwts. of the same manure 18bush. 53lbs.; and from the plot where no manure was used the return was 6bush. 21lbs. Thus the second hundredweight, costing 4s. 3d. in Adelaide, increased the yield by more than 4bush., compared with the use of 1cwt.—surely good business. It was agreed generally, however, by men who had never tried the heavier dressing, that such treatment would blight the wheat, that it would send it all to straw, that it would lodge it, &c.; but let them try it and prove it, and they would find that, except in very rare cases, it was the better practice to use upwards of 2cwts. per acre.

There was a very short discussion on Professor Lowrie's paper.

Conference adjourned for lunch at 1 p.m.

Afternoon Session.

Conference resumed at 2 o'clock.

The Tendency of Climate.

Mr. R. Caldwell, M.P., read a very lengthy paper upon this subject. The following is a condensation:—

When such questions as climate are being considered we realise the truth that "we are but of yesterday, and know not anything." He had not been able to find any work which would assist him in forming conclusions upon his own observations of climatic conditions during his fifty years' residence in South Australia. He had with profit read Sir Charles Todd's "Meteorological Observations," and a volume on "Climate and Health of Australia," by James Bonwick, F.R G.S , of New South Wales, which came down to 1886. Sir Charles Todd, Mr. Ellery (of Victoria), Mr. Russell (of New South Wales), and Mr. Wragge (of Queensland) have confined their attention rather to the collection and tabulation of accurate information with regard to temperature and rainfall and the forecasting of atmospheric disturbances than to the movements of climate, although the effects are at all times related to the cause. Many theories have been advanced to account for the unsatisfactory climatic conditions that have prevailed during the past few years; and it must be admitted that climatic conditions have a much more important bearing on the wellbeing of the people than the policy of a Parliament or the administration of a Government. The question remains, Is the climate of Australia changing: is it colder or warmer, or drier or wetter than in the past? To satisfactorily answer such questions the accurate data of several hundreds of years would need to be available, whereas we have only the gleanings of about half a century at our command. New South Wales records go further back, and these have been used to determine whether or not the extremes do not point to a conclusion that seasons come in cycles with almost tide-like regularity, with a limit of nineteen years. The late Mr. Egeson, an assistant in the New South Wales Meteorological Department, attributed the droughts of Australia to sun phenomena, and predicted a drought which occurred a year later than the time fixed by him. Mr. Russell neither favored the theory nor the deduction, but is said to favor the nineteen-year-cycle theory. Mr. Bonwick, in his work says:—"Periodicity of weather visitations was brought before the Sydney public by Mr. Jevons, a much-appreciated writer on Australian climates. 'I think,' said he, 'it will appear pretty plain from the table of floods and droughts that the history of the Australian colonies comprehends only two complete and two incomplete climatic periods.' This he illustrates by taking the first period of drought, ending in 1798; the second of flood, commencing in 1799, ending in 1821; the third of drought, commencing in 1822, ending in 1841; the fourth of flood, commencing 1842." The first to write of cyles of Australian weather was Governor Brisbane. It is questionable, however, in spite of remarkable coincidences, whether a law of periodicity can be laid down. The theory of a lunar cycle of nineteen years was once advocated by Mr. H. C. Russell. "Eighty-seven years were examined, and of these fifty-two fell into the nineteen-year period, twenty-five were not determined for want of information, and ten appeared to be exceptions." Every nineteen years the moon returns to the same relative position, and Mr. Russell says—"Every year only adds to the facts which, to me at least, prove lunar influence on the weather." The moon's effects on the trade winds he assumes to be the cause of recurrent seasons of drought and flood, and that sea currents are not without their influence—that flowing southward from Queensland along the entire shore of New South Wales is felt for 60 miles from the land, bringing genial airs on its surface. No attempt seems to have been made to ascertain whether the same amount of rain has fallen during the later nineteen years' period as during the former period 100 years ago; or whether the later cycles have been drier than the former. Periods of drought have been recorded from time to time in the history of Australia as well as in other countries, but they do not prove that the seasons are more dry than they were in antecedent years. Australian records do not extend back much further than fifty years. If the climate of Australia is becoming either drier or wetter, the climate of other parts of the world must be similarly affected; and, in conformity with all the operations of nature, this process is bound to be slow. [Unless climate can be injuriously affected by extensive denudation of forest trees, an idea strongly supported by a great number of scientific men, and strenuously opposed by some others.—Ed. *Jl. of Ag.*] The essayist next alluded to the first record flood, and to the mountains, the glaciers, and other objects which formerly existed in South Australia, accompanied by conditions of rainfall, rivers, floods, &c., all of which have departed long since. Nature's energetic action seems to have moderated very considerably since then. Australian scientific records do not extend a century back, but the ranges, rocks, valleys, plains, lake basins, and coastline furnish evidences and results of climatic conditions representing many hundreds—perhaps thousands—of years, and no less reliable in character than the data registered by the instruments of science and recorded with the pens of the meteorologists. The higher ranges of the western portions of Australia are monuments of long and severe denudations—particularly on the western sides of Victoria, South Australia, and Western Australia. The Adelaide plains, between the city and the gulf, have been tested by the drill to a depth of over 2,000ft., and the strata for the most part represent disintegrated matter that came down from the old range The gullies in the hills prove that the streams and creeks were once much broader and stronger than now. The long valley plains of the north are composed of deep beds of gravel and layers of sedimentary deposits, and prove the same truth. [The argument was here continued at considerable length, with numerous illustrations of the changes that have occurred in regard to former huge lakes, rivers, &c.—Ed.] In discussing the weather a short time ago a friend remarked, "I believe the northern droughts are moving southward," and certainly results favor the impression. With the reduction of the area of surface water, the shrinkage of terrestrial moisture, and more intense radiation there must be a weaker evaporation, and consequently a lighter condensation or rainfall. He did not infer that the settlement of Australia had had an appreciably detrimental effect on climatic conditions. A slight effect on the face of nature might, however, have been produced by settlement, for the original inhabitants rarely interfered with the existing order. Trees, shrubbery, herbage, and vegetation were seldom, if ever, disturbed; neither were the springs opened nor the surface water heavily drawn from. During the last fifty or sixty years a very different policy had been in operation. Swamps in the South-East and everywhere else had been drained, large timber trees by hundreds of thousands had been removed from the hills and valleys, and thousands of square miles of surface once covered with scrub had been cleared, roots, grass, and bushes had been destroyed, and millions of acres of soil had been inverted and exposed to the sun and air, with the effect of extracting moisture which had previously been stored in the subsoil. Millions of sheep, hundreds of thousands of cattle, horses, and camels, had for years made a terrible spoliation of the grass and saltbush, and rabbits had during the last twenty-five years destroyed nearly all the indigenous grasses. It would not be wonderful if the causes mentioned contributed to lessen the rainfall. Natural causes had been also at work to reduce the rainfall apparent. Sir Charles Todd placed the average rainfall for the last thirty years at 1¼in. less than the average for the previous thirty years of the colony's settlement. So far as the operation of artificial causes was concerned a sort of normal condition had been arrived at, and he did not think the causes mentioned would continue to operate to still further reduce the rainfall.

Local Ailments of Cattle.

Mr. C. J. Valentine, Chief Inspector of Stock and Brands, read the following paper:—

The numerous losses by farmers of cattle of all ages during this last few years is a matter of so much importance that attention should be directed to some of the causes which bring them about. From all parts of the country reports are received from the dry areas, scrubby country, apparently good pasture country, and from wet, southern, and more favored districts. Disease appears in several forms—impaction of the manyplies, impaction of the rumen, asthenic apoplexy, abomasitis (inflammation of the fourth or true stomach), cripples, depraved appetite, such as craving for bones, rags, &c., acute indigestion, and dyspepsia. The general symptoms of many of them is a dullness, head thrown forward and downward, ears droop, and the animal is wanting in briskness, inclined to mope, accompanied by constipation in some cases, or by diarrhœa in others, the muzzle often dry, and the coat becomes harsh and dry, and if a milch cow, frequently shows a falling off in the milk. Again, in some instances, the milk suddenly ceases and the cow appears to be very bad, rumination will cease, and there is soon a difficulty in breathing. In other cases the animal is listless, will not get up, but will take food if given to her. In advanced cases the tongue protrudes and there is a dropping of saliva from the mouth. Crippled animals, those with swollen joints—rheumatism—appear to have but little the matter with them except showing at times as if in much pain. In some cases impaction of the rumen is noticeable, accompanied by great difficulty in breathing. In such cases action can be at once taken by giving fairly strong purgatives, laxative food in small quantities, and stimulants; laxative food and strong stimulants are the most important steps to be taken. The principal causes are dry, indigestible food, which accumulates in the stomach, weakens the digestive organs until the animals are unable to assimilate their food; feeding on lands which have been cropped until there is a total absence of phosphatic salts which are necessary for the sustenance of the animal system—lands are cattle sick from continued feeding—feeding on the same food year after year from the same source; too much fresh water, particularly in dry seasons, of which we have too many (a certain quantity of saline matter being essential to animal existence). In farms where dairying is carried on the strain on the system of milch cows which are fed on inferior food, or what they can pick up, anemia is produced, and for want of sufficient nutritive food the animals waste and die. In the North, where the locusts ate all the leaves off the food, leaving dry sticks and fouling the remaining pasture, the cattle were left with none but indigestible food, which could only end in one way with the weaker animals. All over the country we find cattle feeding on some lands wanting lime, others salts; in others all the most nutritious plants which formerly grew in the country have been eaten out. It is a constant practice with many to keep more stock than their land will carry, and never grow or save fodder for them; have twenty with feed for ten. Look at many of the animals raised in the country; can the owners ever expect them to make cows or bullocks? A man who milks twenty cows and half feeds them will not do so well as he who keeps ten and feeds them properly. Even where cows have been apparently in good condition, and have died suddenly, the probable cause has been want of attention to the food. Taking cattle very poor and gorging them with rich foods and fresh, succulent grasses, will frequently cause impaction, sudden derangement of the digestive system, and death.

As showing the value of manure on pasture lands, I have noted in several cases where the wheat lands have been manured with phosphates that the cattle like to feed on the stubble land, and have improved in condition, and where losses had previously occurred none have died lately. Similar cases have occurred where lime, salt, iron, and bonemeal have been used. The conclusion seems to be that to prevent losses there must be proper management, and care must be exercised in the rearing and feeding of cattle to keep them in health and make them profitable, as it is raising wheat and other products. Our animals must be properly fed to live and be profitable.

Fruit and Vegetable Growing in the Hills.

Mr. W. E. Hargreaves, Port Elliot Branch, read the following paper:—

I make no pretence to scientific knowledge of my subject, but would simply say a few words to amateurs starting to plant fruit trees in our southern hills. The country of which I shall speak is what is generally known as "stringybark country," where with good cultivation and a little water you can grow almost anything in the way of fruit and vegetables. Most of our scrub country in the south is of this kind, and a great deal of it fairly well watered, either with permanent creeks or with blind creeks, in which with a little labor we can conserve water.

In choosing a situation for a garden it should be where the water is above its highest level. Here make a dam, and from it water can be conducted to any part where required. If there is a permanent stream only a small dam will be required to hold enough for present use, as it would refill in the intervals of watering. It would require a 2in. pipe built in the wall or embankment 1ft. above the bottom of the dam to run the water out. The wall should be strong, and the dam arranged so as to have a good bywash to take all flood-waters. The dam which I have constructed is in one of these blind creeks, where the water runs but a short time after rain. It is made with a clay embankment across the gully, with 2in. pipe and bywash. The size of dam must of course be regulated by the quantity of water required. and this is never likely to have too much. The only actual expense, except labor of construction, is for the pipe to carry the water. A 2in. pipe in the embannkment does not get blocked as a small pipe would be liable to do, perhaps when most busy watering. [Mr. Hargreaves here exhibited a photo. of his five-year-old orchard, also exceptionally fine samples of the fruit grown thereon. —Ed.]

When starting to plant a fruit garden some amateurs are in too big a hurry to get a lot of trees put in, and plant them between the scrub. This is a great mistake. Even if they can only get in a few every year they should grub everything, plough the ground 6in. deep, then dig holes 4ft. x 4ft. and 2ft. deep. Break up bottom of hole, and fill up with surface soil only. Too much after-ploughing leaves the ground too hollow; one ploughing each year is sufficient. The horsehoe is the best implement for use in the garden, as it keeps the ground nice and loose on top without the hollows underneath, as is the case with plough furrows. Besides this, it is much the cheapest method of cultivating, as one man can horsehoe a fair-sized garden in a day. He can also hoe close to the trees if he has a quiet horse, and this saves a lot of hand labor. Do not buy trees at an auction sale, as they are often of no good, and when they should be coming into bearing they are half-dead, lumpy, stunted things, an eyesore to look at. Go to an honest nurseryman who has a good name, and pay him a fair price for a nice lot of clean, well-shaped trees, and true to name; and with good culture with horsehoe they will grow more in one year than they would in three among the scrub with no culture.

It has been said that fruit trees will not grow on poor land, but the fault is not in the land; it is the fault of the man who was born tired and never got rested. He digs a small hole the size of a posthole, crams the roots of his tree into it, gives it a bucket of water, and thinks it should grow after he had taken so much trouble to plant and water it. There are hundreds of acres in our hills too poor to grow wheat that would grow fruit of nearly any kind. On this so-called poor land we should grow thousands of bushels of fruit for the English market, give work to the unemployed, and have a few thousands of the money which is sent every year to other countries for fruit.

Pruning has a lot to do with the welfare and productiveness of the tree. When it is young do not spare the knife; you will then have well-shaped trees, with fruit close to the breast instead of out on the ends of the branches, and it will not blow off so readily. No hard-and-fast rule can be laid down with regard to pruning. One tree will maintain a tendency to run up, and the next will spread out. Each one must keep an eye on his own trees, and exercise his own judgment; but do not be afraid to cut back, and maintain a proper balance in the head of the tree. Give good cultivation a few times each year, and success will reward all well-directed efforts.

Exporting Honey to England.

Mr. O. Nootnagel read a paper to the following effect:—

At present there is no systematic arrangement for the profitable disposal of South Australian honey. Co-operation amongst the beekeepers is necessary, and also a depôt in London, with one in Australia. It was necessary that there should be bulk stores in Australia, because exportable quantities were not obtained in these colonies annually. The honey should be classed and named in the Australian depôt, and shipped to the London depôt, where it could be put up in smaller parcels, tastefully labelled, and offered for sale by an agent, who should have no other than the Australian honey interest to advance. If the beekeepers could not amongst themselves manage the necessary monetary provision for the establishment of the trade, he saw no way but to appeal to the Government for a bonus from three to five years on all approved honey stored for export in the Australian depôt. This would be all that was requisite. He had known beekeepers hawk honey in the streets of Adelaide at 1½d. per pound. If the bonus could not be arranged, then the beekeepers should form "trusts" or "boards," and endeavor to procure advances on somewhat similar conditions to those now obtained in this colony by farmers and others under the Vermin-proof Fencing Acts.

It was stated that samples of South Australian honey tasted in London were strongly impregnated with added eucalyptus oil. The New Zealand beekeepers had appointed an agent in Great Britain, who placed their honey at various stores in neat packages, and now the honey that was formerly despised and decried was eagerly purchased at profitable prices.

Some Aspects of Dairying.

Mr. J. Davidson, of Port Elliot Branch, read a lengthy paper upon this subject. The following are the principal points:—

There are a great many stages between the cow on the farm, through the modern cheese or butter factory, the refrigerators, the great army of middlemen and dealers, the cold storage warehouse, the floating refrigerator carrying the produce across the ocean, then another army of dealers, and finally the consumer. Every step in this procession is lit up with the light of modern ideas, methods, and economies. Science, invention, capital, and enterprise have done much for dairying, and can do more in the future, but progress or retrogression rests in a great degree upon the man who controls the dairy herd. We are at a critical period: the days of high prices have departed, but will not be excessively low, because an outlet has been opened by export of the surplus. Future profits must be effected by cheaper production, and this can only be effected by the farmer. Most of the progress up to the present has been brought about after the product has left the farm, not before. The great majority of farmers are producing milk as expensively as they ever did. Every business man counts the cost in every department, but does every farmer do this? Old methods, old stock, old habits, and prejudices that cannot stand the test of comparison with high standards must be abandoned in favor of the newest and best which will add effectiveness to the work. Beyond the farmer there has been a great reduction of expenses in handling and manufacturing dairy products within the past twenty years, but the majority of farmers have made no progress in this direction. The decreased cost of producing milk, of manufacturing butter and cheese in other countries, and the cheap, safe, and prompt transportation to consuming markets, gives an enormous advantage to the competitors against Australian dairymen, who must study how to reduce the cost of producing milk to a point that will defy competition. There are more and greater fluctuations in the prices of other farm products than in milk, and the returns are quick and sure. The problem of cheaper production should be considered under three heads—(1), the cow, what she must be, and how fed and handled; (2), the farm and its management; (3), the cost of milk per gallon. A man might have the best cows, but if badly managed they would fail to pay, or he might well and skilfully feed poor animals without paying results. Further, he might have good cows, and be a skilful feeder, but if he was a poor manager of his land, and did not grow milk-producing feed cheaply, or if he neglected to keep up the fertility and producing power of his farm, he would not succeed. The cow that would put fat on her back and into her milk at the same time had yet to be found. It was impossible to have a good milker and beefer combined. What was wanted was a "special purpose" cow—a cow that would give a large quantity of rich milk for 10 months in the year—not less than six times her own weight. He recommended the milking family of Shorthorns, and thought a cross between the Jersey and Holstein would give good results. It was desirable that the cows should be large, with a healthy constitution, good appetite, and sound digestion. Good milking qualities in cows are hereditary, and are transmitted from sires and dams. No amount of feeding will make a poor quality cow give rich milk. A cow immediately after calving will give a large quantity of milk, which may test 3·5 per cent. of butter fats; a few months later it may show 4·0 per cent., and towards drying-off time she only gives a very small quantity, which may register 6·0 per cent. or more. Records should be kept to show the number of pounds of milk given by each cow, and tests made from time to time to show the percentage of butter fats. It is quite possible to breed a cow that will produce as much butter as two ordinary cows. The evil system of buying milk by weight is dying out in favor of purchasing on test for butter fats. The old system gave no encouragement to improve the breed of cows or to enrich the land and the herbage thereon. The cultivation of special fodder crops should be a prominent feature in progressive dairying. Amongst these the mangold is one of the most valuable, but the roots must be matured by storing in clumps or otherwise after being pulled. This develops the saccharine qualities of the root. Mangolds do not impart any flavor or odor to the milk, but increase its quality and help to maintain the period of the flow. For every extra month during which the supply of milk can be kept up the greater will be the profits derived from the cow. The paper concluded with some remarks upon the treatment and management of cows.

The Standard Sample of Wheat.

After a few remarks by Professor LOWRIE, and a short discussion, the following motions were submitted by a member, seconded by another, and unanimously adopted:—"That this Conference of farmers think the time has arrived for an inquiry whether it is practicable to fix a constant standard for wheat, to be graded as No. 1 and No. 2." "That it be a request to the Central Bureau to move for a representative meeting of farmers, millers, and wheat-buyers, to decide whether the proposed change should be made, and to fix the constant standard if the proposition is carried."

Conclusion.

Mr. MOLINEUX proposed a comprehensive vote of thanks to the Chairman, the readers of the papers, and the Secretary of the Local Branch, upon whom a lot of work devolved. The motion was carried with acclamation.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, APRIL 25, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Hon. A. W. Sandford, M.L.C., Messrs. Samuel Goode, Thos. Hardy, M. Holtze, T. Price, M.P., T. B. Robson, C. J. Valentine, and A. Molineux (Secretary).

Standard Sample of Wheat.

The SECRETARY called attention to resolutions passed at the various Bureau Conferences during the past two months dealing with the question of the standard sample of wheat, and asking the Central Bureau to arrange for conference of wheatgrowers, wheatbuyers, and millers to consider whether it is not practicable to have fixed standards and two grades, as suggested by Professor Lowrie. The Secretary suggested that the Bureau should ask the Corn Trade Committee whether they would meet representative growers and some member of the Central Bureau to consider the proposal, and if possible arrive at some decision. If they were agreeable the meeting might be held during Show week. A long discussion ensued, and it was resolved that in the opinion of this Bureau the time has arrived for an inquiry as to whether it is practicable to fix constant standards for wheat, having two grades, as suggested by Professor Lowrie.

The **Chairman** directed attention to remarks in the annual report of the Chamber of Commerce to the effect that severe and unjust criticism had been directed against the adoption of the standard of 63lbs. per imperial bushel for 1899-1900, such criticism being founded in the main upon ignorance of the functions and province of the Corn Trade Section Committee of the chamber. The committee had to adopt a fair average sample of the season's crop for trading purposes, not to fix an abnormally high standard to induce growers to clean their wheat better.

Mr. **Goode** said the Chamber of Commerce distinctly stated that the only samples to be sent in for use in fixing the standard for the season were to be of wheat sold at market price without any deduction. He had not the slightest hesitation in saying that some samples must have been accepted by the secretary of the chamber that would never have been accepted by a miller or buyer who knew his business, as the sample sent out as the average sample for the season contained sufficient bunt balls to cause a very distinct smell. It was not the method of fixing the sample that he and other members had objected to so much as the mixing with the bulk of "smutty" samples, which should never have been accepted. Nearly all the criticism had been founded upon the fact that if such an inferior sample as received by the Bureau (containing as it did a lot of bunt balls, drake, oats, &c.) would weigh 63lbs. per bushel, a fair average sample of the season's wheat would weigh heavier, and consequently be worth more per bushel.

Mr. **Sandford** said this matter cropped up annually, but they seemed to get no further forward. Professor Lowrie's suggestion appealed to him as a very probable solution of the trouble. It was the system adopted in the largest wheat-exporting country of the world, and he could see no reason why it should not work equally well here. He was, however, opposed to Secretary's suggestion. It would be better to discus the matter thoroughly at next meeting and come to some conclusion as a Bureau, and then approach the Chamber of Commerce with a definite suggestion. To wait until September was to lose time and probably achieve nothing, as the same matter had been discussed more than once at the Congress meeting. He would move—"That at next meeting we take into consideration the subject of the standard wheat sample, and that Professor Lowrie be particularly requested to attend."

The **Secretary** pointed out that the Bureau had already passed a resolution that they were of opinion that the time had arrived for an inquiry into the matter, and his idea was to approach the Chamber of Commerce at once and ascertain whether the Corn Trade Committee would meet representative growers at such an inquiry. It was waste of time discussing the matter again at the Bureau meetings until they knew whether the Corn Trade Committee would meet them. The question of time of holding inquiry was a matter easily settled.

Mr. **Holtze** said he suggested three or four years ago, when the matter was under discussion, that the only satisfactory plan would be to sell according to sample—in other words, have two or more fixed grades—but what was the use of the Bureau attempting to deal with the matter if the Chamber of Commerce stood out?

Mr. **Price** moved that immediate steps be taken to endeavor to arrange for a conference of three members from the Corn Trade Sectional Committee, three representative wheatgrowers, three country wheatbuyers, and three members of the Central Bureau, to consider the practicability of giving effect to the resolutions *re* standard sample of wheat carried at the various conferences. This was seconded and carried, and the Secretary instructed to communicate with the Chamber of Commerce on the matter at an early date.

Annual Congress.

It was decided that the twelfth Annual Congress of the Bureau be held in Adelaide during Show week in September.

Botflies.

The **Secretary** reported receipt of specimens of botflies and gadflies from the Agent-General (Sir Jno. A. Cockburn).

Mr. **Hardy** said the botflies were very troublesome in New Zealand, causing numerous losses.

Mr. **Valentine** said parts of the Western Districts of Victoria were also badly affected, and several cases had been reported from the South-Eastern districts of this colony.

Agricultural Colleges.

Mr. **Thos. Hardy** reported having visited the Lincoln Agricultural College, near Christchurch, on the occasion of his recent visit to New Zealand, and was kindly shown over the farm and college by the principal. The farm consists of about 700 acres of splendid land, but more was required to carry on the work properly. There were very complete indoor and outdoor staffs and fine buildings, but he regretted to find that only about twenty students were in attendance, the most at any time being forty, whereas there was accommodation for quite double that number. Each student had a separate bedroom, and there was a study for every two students. The fees amounted to about £50 per annum, and the course of instruction was very complete. A flock of 1,500 sheep was kept, there being six different breeds, and they were used principally for experiments in crossing to produce best "freezers." About 250 acres are yearly under crop.

Members thought the fees were not entirely the cause of farmers not sending their sons to college, although most of them could not afford £50 a year in addition to losing the services of their boys. In different parts farmers' sons could earn their living and get a good practical grounding in agriculture on the well-managed estates of the various wealthy landowners in New Zealand, the consequence being that the college was not so well supported as it deserved to be.

Analyses of Bluestone.

The **Secretary** stated that of twenty-seven Branches asked to send in samples of bluestone for analyses only thirteen had done so. Of the samples sent in only three contained less than 95 per cent. of pure crystallised bluestone. These were from Mundoora, 93·1 per cent. purity; Appila-Yarrowie, 90·9 per cent. purity; and Lipson, 87 per cent. purity.

Members considered results very satisfactory. Even the worst of the samples was of such nature that it would make an effectual pickle if used properly, though a little more than usual would be required.

Frosted Wheat Crops.

The CHAIRMAN said he had obtained an opinion from Germany in regard to the question whether bearded wheat was less susceptible to damage by frost. The answer received was that their frosts occurred before the wheat comes into flower, and they could not therefore give a direct opinion. Rye was, however, often injured by frost, especially in low situations; all the varieties of rye were bearded, and they therefore think bearded wheat would also suffer. The flowering of rye was, however, different from that of wheat; the former receives its pollen from outside, while with the latter the fertilisation took place inside the glumes, and consequently was not so liable to injury by frost at time of flowering.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

345. *Agricultural Stations in Japan.*—In April, 1893, seven of these were founded, and in 1896 three more In addition to experimental work with seeds and the use of artificial manures, analyses of soil, and protection against noxious insects, &c., all questions asked by agriculturists are fully answered. To the cultivation of rice, cotton, peas, beans, and all vegetables, and of Polygonum tinctorium most attention is given. The latter is one of the most important dye plants of Japan.

347. *Improved Horseshoes without Nails*, for which Mr. Wakfer took a patent, are now adopted by the London Omnibus and Tramway Company and many private persons. The shoe is kept in position by a flexible metallic ribbon over and a spring in the arresting bar in front of the hoof, and the great advantage is that you can take the shoe off and put it on again as may be required without the aid of a smith, and in travelling long distances take a supply, and lose no time in fixing a shoe.

348. *Nitrogenous Manure for Peas.*—Although peas are nitrogen gatherers, it appears that, where the soil does not contain already sufficient nitrogen, after the young plant has consumed the nitrogen in the pea itself, it stops growing and begins to look yellowish, in fact, shows a want of nitrogen for some eight or ten days. Afterwards it recovers its natural green color and grows again vigorously. If the roots are examined during the above interval no exceresсences will be found on them, which, however, afterwards make their appearance, and enable the plant to obtain the necessary nitrogen from the air. It is therefore advisable in such soils to give the peas either a little stable dung or 100lbs. of nitrate of soda per acre to prevent this suspension in the growth.

349. *Cultivation of Potatoes.*—In England, Wales, and Scotland 524,591 acres were planted in the year 1898, in Ireland 664,912 acres, and in the Channel Islands 11,914 acres, or a total of 1,201,417 acres. In Germany about 7,631,975 acres were planted, which shows the great importance the potato has there, not merely for direct consumption, but for industrial purposes.

350. *Lameness of Cattle and Pigs.*—It is apparently not well understood that this is a result of a want of mineral salts in the water and the food. Veterinarian Hoene states that many animals, and especially pigs, try to make up for it by consuming earth. He has used for pigs that could not walk any more kettle-stone (the lime and other minerals deposited after water has been boiled). This he pounded, and mixed a tablespoonful of it with the food for each pig. The result was phenomenal. Hay that has been in the field and frequently wetted by heavy dew and rain loses much of its nourishment, and it is desirable to mix as much as 1lb. of salt per hundredweight with it.

351. *Homesteads for Agricultural Laborers.*—The migration of the young from the country to the towns has become such an important factor in agronomy in Germany (and in many other countries) that it is found to be quite impossible to replace all the laborers by immigration from abroad. Three of the great parties in the Reichstag (Centrum, Antisemites, and Conservatives) have therefore unitedly prepared a bill, which, if passed, may prevent the exodus, at least to a great extent. Landowners who provide homesteads sufficiently large for the cultivation of some agricultural produce (but not too large) shall receive a rental. The homestead cannot be divided; transfer or transmission must be granted by a court to one person only, on condition that the occupier of such homestead shall work as an agricultural laborer, and not in industrial pursuits.

[Members regarded the above as going back to the condition of serfdom.]

Reports by Branches.

The SECRETARY reported receipt since previous meeting of 116 reports of Branch meetings. Members were pleased to note the commendable activity of the Branches.

New Members.

The following gentlemen were approved as members of the after-mentioned Branches:—Brinkworth, Mr. W. Welke; Millicent, Mr. F. E. Wehl; Lyndoch, Messrs. F. Warren and H. Springbett; Morgan, Messrs. R. Wohling and C. Moll; Clare, Mr. G. Scott; Port Germein, Mr. H. Kingcome; Morphett Vale, Messrs. F. Pocock and Goldsmith; Watervale, Mr. G. Holder; Appila-Yarrowie, Mr. R. H. Grant; Renmark, Messrs. Chas. Miller and Fred. Cole; Holder, Mr. W. J. Wood; Bakara, Mr. J. Roy; Narridy, Mr. Thos. Dunsford; Hawker, Mr. C. Bales; Lyrup, Mr. W. R. Lewis; Pyap, Mr. J. Napier; Bowhill, Mr. Norman; Yorketown, Mr. S. Vanstone; Tatiara, Mr. Hugh Scott; Clarendon, Messrs. W. Hentz and E. Drummill.

REPORTS BY BRANCHES.

Bakara, March 15.

Present—Messrs. W. G. Wilson (in chair), E. Wall, R. Barrow, A. Lehmann, F. E. H. Martens, and two visitors.

Rules.—It was decided to adopt as the rules of this Branch the printed suggestions for rules furnished by the Central Bureau.

Standard Sample of Wheat.—Discussion took place on this subject, and it was considered that the sample sent out by the Chamber of Commerce was a fair average, though the quantity sent was too small to judge satisfactorily.

Narridy, March 17.

Present—Messrs. A. McDonald (Chairman), Jno. Liddle, A. Fairstow, J. Smart, R. Satchell, J. Nicolson, and J. Darley (Hon. Sec.).

Killing Gumtrees.—The Chairman asked best way of killing gumtrees; he had tried ring-barking at all seasons of the year without avail. The tops would die, but the trees would throw out shoots from the bottom.

Manuring.—Mr Satchell manured a piece of land, eight years ago, with stable manure, but up till last year the crops on it blighted off. Last season, however, the wheat matured all right, and produced a good crop. He knew a farmer in the district who, last season, manured plots with Super, Thomas Phosphate, and guano. Super yielded best, Thomas Phosphate next, and guano a long way behind, while the land not manured was almost a failure.

Port Elliot, March 31.

Present—Messrs. J. Brown (in chair), H. Green, sen., W. E. Hargreaves, J. R. Coote, H. Pannell, J. Davidson, and C. Hill (Hon. Sec.).

Preservation of Implements.—Mr. J. Davidson read the following paper:—

Implements and machinery on the farm are more subject to illusage than those in use in the shop or factory, because they are, when in use, exposed to the weather. There are many commonplace rules with regard to the proper care of them well enough known but which are not practiced. If the exposure to the weather went no further than during the time the implements were being utilised, the injurious effects of sun and rain would be reduced considerably. One does not require to explore many farmyards and paddocks in our neighborhood to be convinced of the fact that a great amount of carelessness and neglect of the proper care of farm implements exists. Too often we see them put away for the year in the shelter of a wire fence, or employed to fill a gap in a fence, or taking the place of a dilapidated gate. In the case of iron and steel implements, corrosion is the agent that works destruction, and as a preventive these should be treated with some kind of anti-corrosive application, such as paint, grease, oil, or kerosene, as soon as they are finished with for the season, and then put away in a rain-proof shed. Exposure to the weather quickly removes the paint. when rust will commence its work. Though this may seem a small matter it nevertheless destroys the appearance and reduces the market value of a new implement. Now, when farmers will be shortly bringing their ploughs into requisition, a good deal of trouble will be given for the first few days in getting the mould-boards clean, where during the year they have been allowed to corrode. Considerable time will be lost scraping off the soil, the draught will be increased about one-horsepower, meaning a loss of horse flesh ; anyone knows it is much harder to drag a rusty plough to which the soil adheres than one as bright as a shilling. This may be prevented by a little trouble and forethought. When the ploughing season is over and the plough is bright, it should be painted over on the clean parts with some ordinary oil paint, which can be easily scraped off when the plough is again wanted. Better still is an application of one part of melted tallow and one of linseed oil; this will stay corrosion. Many other remedies will suggest themselves to those who are so inclined. These preventives will apply to all implements having bright parts which are not in constant use. With regard to the more intricate machinery, such as mowers, binders, seeddrills, and chaffcutters, the bearings should be removed and cleaned before the oil coagulates; this will ensure smoother running of the bearings and reduce the friction and wear. Frequently sand and grit find their way into these, which will cause speedy wear of the brass, and, in case of fast-motion spindles, the friction would be great. As little play-room as possible should be allowed in fast-moving machinery, and nothing allowed to work in a loose state which would cause unnecessary vibration, for upon this rests the principal wear and tear of the machine. Machines, whether of wood or iron, or both, should be always carefully housed, the weather effects upon wood being more severe than on iron. The action of sun and rain on woodwork soon leaves its mark in removing the new guilt and then the paint. This having gone, the moisture and heat will cause the wood to crack and twist, and in a few months the once new article will have deteriorated in looks and value. It should be the imperative duty of every farmer to erect some kind of sheltershed for his implements and machinery.

Here is a circumstance that often occurs with the negligent farmer. At the end of the season his mower has got into disrepair. The machine is put away in this condition to await the coming of another harvest. His hay may come on fast, and all is bustle to get at it. On bringing out his mower he finds it is out of repair, and must go to the smith's before a start can be made. The smith is busy at this time, and a few days elapse before he gets his mower done. The consequence is the farmer sustains a loss on the value of his hay. On the other hand, the methodical farmer would have had his machine put in thorough order at the end of the previous season. If this were done in the case of all machinery and implements time and valuable crops would be saved.

It is hardly to be supposed that every man on the farm can be expected to be an all-round mechanic, and be able to do any kind of job needed; but there is one thing nearly every man can do, and it is the one feature most sadly neglected on the farm. It does not require a mechanic, much less an artist, to do a good deal of painting called for about farm implements, and also general farm fixings and buildings. With white lead, oil, a little color, and a few brushes, almost any handy man can make a fair job of painting ploughs, drays, wagon wheels, and other implements, and thus save pounds in a year. A little forethought would provide the materials and keep them handy for use when other work is not pressing.

Hawker, April 11.

Present—Messrs. A. C. Hirsch (Chairman), J. Hill, J. Wardle, C. W. Pumpa, S. Irvine, H. M. Borgas, C. E. Harry, J. P. O'Loughlin, J. W. Schuppan, F. C. Hirsch, and J. Smith (Hon. Sec.).

Officers.—Mr. S. Irvine, elected Chairman ; Messrs. H. M. Borgas and A. C. Hirsch, Vice-chairmen ; and J. Smith, re-elected Hon. Secretary. Officers for past year were thanked.

Drilling Wheat.—Mr. Borgas read a paper to the following effect :—

As there have been some drills purchased this year by farmers in this locality a few observations upon the depth to sow seed may be of use. Last year the drilled fields gave 55lbs. per acre more grain than was obtained from broadcasted fields, but had the drilled wheat come away with that broadcasted there would have been a considerably greater difference in favor of the drill. The drilled grain was covered 3in deep in the soil, and took longer to get through the ground. Which is the best drill is a question he did not care to say ; but care must be taken not to put the coulters too deeply in the ground. It is true that the drills can be set to sow on the surface, but this gives no advantage over broadcast sowing. Seed should be about 1½in. deep, and the coulters should throw up a light ridge on each side, so that light rains may run down into the furrow and give all the benefit to the young plant. If the seed is 3in. deep it will take ¾in. of rain to penetrate and give it a start. If the soil is liable to cake and no more rain falls for four or five weeks there will be many plants killed. Some seeds sowed this season 2½in. to 3in. deep had 1·35in. of rain, and the plants do not appear very thrifty; but some seed sown 1in. to 1½in. had only 0·75in. of rain, and the plants are very good.

Mr. Hirsch said the drill is an excellent machine for seeding, but great care must be taken not to place the seed too deeply. Mr. S. Irvine said his wheat sown with the drill and with manure was much stronger and healthier looking than that sown without manure. The Hon. Secretary thought 1in. quite deep enough to sow wheat, and the seed bed should be well pulverised. Mr. Hirsch would like to see a blade affixed to the shoe of the drill, as this would cut the weeds as well as pulverise the soil.

Experiments.—Mr. Wardle tabled a stalk of a tall-growing grass (Sorghum halepense gigantea, or Giant Johnson Grass). It was in full seed, and 3ft. 6in. high. Seed was sown in September last, and no attention was given. In February its growth astonished him. No water was given. Japanese climbing cucumbers flowered, but failed to set any fruit. Homerus watermelon produced nice fruits, which, however, cracked when ripe. Turkish Giant sweet melon was a splendid fruit, and was prolific.

Dawson, April 7.

Present—Messrs. R. Renton (Chairman), C. W. Dowden, A. J. Hooper, C. F. W. Just, W. Kelly, C. H. Meyers, and A. Dempsey (Hon. Sec.).

Standard Sample.—Members were agreed that it is desirable that a permanent standard of quality should be adopted for South Australian wheat; and that the Central Agricultural Bureau should endeavour to convene a meeting of representative farmers, millers, and wheat buyers to bring about this reform.

Hailstorm Relief Fund.—The Hon. Sec said there was a small balance in hand.

Lucindale, March 31.

Present—Messrs. J. C. Newman (in chair), A. Matheson, A. Carmichael, J. Bourne, A. Dow, and E. E. Dutton (Hon. Sec.).

Officers.—Messrs. E. E. Feuerheerdt and E. E. Dutton were re-elected Chairman and Hon. Secretary for ensuing year.

Business.—Matters in connection with the recent Conference, and the arrangement for loan of bull from the Department of Agriculture were dealt with.

Wilmington, April 12.

Present—Messrs. Wm. Slee (Chairman), A. Paull, M. Gray, J. Zimmermann, H. Noll, J. Hannigan, J. Lauterbach, T. Carter, and R. G. S. Payne (Hon. Sec.).

Johnson Grass.—A vigorous plant of Aleppo Grass (Sorghum halepense, variety giganteum), generally called "Johnson grass," was exhibited, and members decided to give it a further and more extensive trial.

Ploughing Under of Stubble, &c.—Mr. Zimmerman gave a brief description of an original scheme for chaffing stubbles and other vegetable growth on the land, so that the same can be ploughed under without resorting to the wasteful process of burning. Members discussed the mechanism, cost of working, and the wisdom or otherwise of ploughing under so much straw, which might have a tendency to produce a hollow under-bed in dry seasons. The following is the substance of the paper:—

The greatest mistake is made in the burning of stubble, and the greatest drawback of the stripper is that the stubble cannot be ploughed under. An appliance could be made to treat the stubble so that it could be ploughed under and harrowed without any trouble. The appliance would be very similar to a twinebinder as far as the cutting part is concerned. The cutting part of an old twinebinder could be utilised, but the straw would be conveyed to the back of an apparatus which would cut it into 3in. or 4in. lengths and drop it on to the ground. If many farmers were to use such an appliance its cost would not be great. At fallowing time such weeds as wild oats, cockspur, wild rape, mustard, stinkwort, and all the rest of the farmers' pests of the tall-growing sorts could be treated in the same way as stubble. This would be better than the skim coulter or the drag chain, as in these cases the uninjured weeds have a great propensity for growing through the furrows, and if not attended to would produce enough seeds to nullify the work done to clear the land of weeds.

ENSILAGE.—Resolved that Mr. Hutchens be requested to re-read his paper on ensilage-making, in order that new members and others may have an opportunity of considering this important matter.

Onetree Hill, April 12.

Present—Messrs. J. Bowman (Chairman), F. Bowman, G. Bowman, J. Hogarth, F. L. Ifould, A. Thomas, and J. Clucas (Hon. Sec.).

STANDARD SAMPLE.—Members considered that the standard sample of present season's wheat sent by Chamber of Commerce was a fair average.

BUNT.—Mr. Hogarth agreed that the presence of bunt in wheat is the result of faulty pickling. It is a fatal mistake to return the pickled wheat into bags likely to be defiled with bunt from "smutty" wheat. Immersing the seed, placed in bags, is more expeditious and safer than pickling on the floor. He thought the pickle should contain as much bluestone as can be dissolved in the water.

RABBITS.—Reported that rabbits continue to become scarcer.

"SHEEP ON THE FARM."—Mr. F. L. Ifould read a paper to the following effect:—

It is astonishing that there are so many farmers who do not keep sheep. Every one who has 500 acres or more should keep sheep. On smaller areas it may not be advisable except for rations. The larger the farm the more profitable is it to keep sheep. There seems to be a prejudice with some farmers against these animals; but in a few years the majority of farmers will become sheepfarmers also. There is no stock that will give a bigger return than sheep for the feed consumed, and none that will more quickly restore wheat-sick land to its original fertility. Rotation of crops is all very good in its way, but if practised on a large scale what is to be done with the crops? Wheat must always be the chief product of the farm, and to grow anything extensively that cannot be exported must eventually prove unremunerative. In order to give the land a rest from wheat, keep sheep. Although the commercial fertilisers are continuing to work miracles, the land must have rest. The paddocks should be spelled alternately, and be grazed with sheep. They can be used to feed off weeds on the land that is to be cultivated for wheat. By obtaining change of seed from all parts, the land becomes very foul with weeds, and it is marvellous to see how soon the sheep will eat out stinkwort, cockspur, poppy, Cape marigold (wrongly called "dandelion"), and numerous other weeds, which are thus turned to profitable account instead of encumbering the land and impoverishing the crops. They also save much labor in scarifying to kill the weeds and prevent them seeding. Early crops are often benefited when eaten down by sheep. Doubtless many farmers would keep sheep were it not for the expense of sheep-proof fencing their paddocks; and this is absolutely necessary. This is not a very expensive matter where there is already a three-wire fence. A ton of wire goes a long way, and the labor of putting it up, as well as of looking after the sheep when it is erected, is trifling. It is on account of the small amount of labor connected with sheep that they are so profitable. Then the wool and the lambs form a big source of income. In view of the great possibilities of the frozen lamb trade, probably the most profitable sheep are breeding ewes. A good class of ewe, well fed, will cut a very decent fleece besides rearing a lamb. They may be fed considerably upon the weeds and herbage which otherwise would go to waste. Where crops are cut for hay there is less feed for the sheep; but the number that can be kept on stubbles with plenty of water is astonishing. Ewes that have had their lambs taken away do not require a great deal of feed until next lambing—in fact, good forward wethers can be fattened on good stubbles if they have plenty of water—but it is not advisable generally to buy wethers, as they are risky, and breeding ewes on small areas of land will pay better. During the past eight or ten years Merino wool has been selling very much better than any other sort, but just now it appears as though crossbred wool is again coming into demand. From the "wool" point of view, of course, Merinos must be the sheep of Australia; but the all-round sheep for the farmer is probably the come-back. She is larger, is a good mother, and cuts a big fleece that must always be marketable. Many advocate the first cross Merino and Lincoln, which, no doubt, are very suitable, but many of them turn too much to the Lincoln, giving a wool too strong and not so valuable. In regard to rams, the general opinion favors the Shropshire—in fact, a farmer may do worse than keep Merino-Shropshire first cross ewes and put them to a Shropshire ram again to breed market lambs. So far as the lambs are concerned he could not go wrong, and the wool would probably bring a good price. It is pretty dense and fairly long in staple. The ewes are wonderful doers, and will rear a good lamb on less feed than any other cross. Professor Lowrie strongly favors the Dorset Horn ram, and his opinion carries great weight with farmers who know him. No farmer can afford to breed ewes, as he can buy them more cheaply. Never use any but pure-bred rams of the best quality that the purse can afford. Do not overstock, as lambs once checked never do so well afterwards. A lamb dropped in May or June will be worth more in October or November than one dropped in March or April and checked in growth, and the ewe will cut more wool.

Mr. Hogarth emphasised the objection to the Merino-Lincoln cross, as the staple is mixed and difficult to class. It was pointed out that the wool from come-backs sold well, but that to breed from them was likely to result in deterioration. Mr. Hogarth recommended the keeping of sheep on the plains where water could be found near the surface, and Mr. F. Bowman advised purchasers to secure station-bred sheep as less likely to prove fence-breakers.

Robertstown, April 11.

Present—Messrs. N. Westphalen (Chairman), A. Rohde, F. Fielder, T. Hagley, H. Kotz, A. Day, and S. Carter (Hon. Sec.).

Wheat Experiments.—Following reports on experiments with wheats from Central Bureau were tabled. Mr. Fielder sowed Bartlett's Crossbred and Indian King but both failed. The former with Mr. Hagley was inferior to Purple Straw. Mr. Rohde sowed Bartlett's Crossbred and Steinwedel at same time, but the former ripened two weeks before the other. It did not stool, but the heads were very full; 42ozs. sown yielded 480ozs. of good grain.

Paskeville, April 14.

Present—Messrs. A. C. Wehr (Chairman), A. Goodall, G. Bammann, W. Westphall, F. Bussenschutt, J. C. Price, A. Palm, J. H. Nankervis, and W. S. O'Grady (Hon. Sec.).

Wheat Experiments.—Seed wheats received from Central Bureau were received and distributed, four members undertaking to test same. It was agreed to put the new varieties in the field alongside the ordinary crop, sowing by means of the drill, but using only the nine central hoes so as to leave the width of two hoes on either side bare.

Dairying.—The Hon. Secretary reported that the Ayrshire bull, Doctor 2, had been received on loan from the department. Members were greatly pleased with the appearance of the bull, and hope the district will materially benefit from his presence. Several members stated that they found a mixture of copra cake, bran, and cocky chaff to be one of the best feeds to give to milking cows, the animals doing better on it than on chaffed hay. Mr. Palm said the stopping of the allowance of copra cake showed immediately in a falling off in the cream produced.

Standard Sample of Wheat.—Considerable discussion ensued on the standard sample of the 1899-1900 harvest as sent out by the Chamber of Commerce. There was some diversity of opinion on the matter; some members said it was "not bad" while others considered it badly cleaned, with some grains slightly pinched. It was unaminously agreed that although it might be a fair average sample for the whole colony it was not equal to the average sample of the wheat produced in this district last season. Mr. Goodall pointed out that although the proposal of Professor Lowrie for a fixed high standard for our wheat would doubtless be a good thing, still if they should experience a pretty general bad rust season it would severely affect the wheatgrowers, as very little grain would reach the standard, and docking would be the general thing.

Wilson, April 4.

Present—Messrs. D. McNeil (Chairman), W. H. Neal, J. H. Gill, H. Ward, and A. Canning (Hon. Sec.).

Wheat and Manure Experiments.—The Hon. Secretary reported that he had sown eleven plots with wheat and different manures to test the question of the benefit of applying manures in such a dry district. Each plot was four square rods in area. He had also twelve different varieties of wheat sown side by side for testing.

Strippers.—Discussion took place as to the best stripper on the market, and the merits and demerits of the various makes were referred to. It was thought that many of the newest ideas in and additions to these machines did not add to their utility. The machines varied greatly in draught, and members could not understand why there should be so much difference in this matter in machines of the same make turned out by one firm. It was generally thought that the machines were heavier than was at all necessary.

Standard Sample of Wheat.—The Hon. Secretary read Professor Lowrie's reply to Mr. Hart on this matter, and some discussion ensued.

Brinkworth, April 5.

Present—Messrs. G. Freebairn (Chairman), H. Shepherd, A. W. Morrison, C. Ottens, H. J. Welke, G. Wooldridge, and J. Stott (Hon Sec.).

Dairying.—Arrangements were made for care and keep of the Jersey bull loaned to this Branch by the Department of Agriculture. It was decided that the fee for service be 2s. 6d. for cows owned by members of the Branch, and 3s. 6d. for others.

Cherry Gardens, April 10.

Present—Messrs. T. Jacobs (Chairman), J. Mackereth, G. Hicks, G. Brumby, J. Lewis, E. Wright, and A. Broadbent.

Sparrow Destruction.—It was decided to continue to offer prizes each month for the children who bring in the most sparrow heads. The small prizes offered by the Branch have been the means of keeping the sparrows down to reasonable numbers.

Gladstone, April 7.

Present—Messrs. C Gallasch (Chairman), E. Matthiessen, J. Shephard, W. A. Wornum, J. Sargent, D. Gordon, J. Brayley, and J. Milne (Hon. Sec.).

Death of Sheep.—Mr. Brayley reported having lost ten of his best ewes about a fortnight before their time for lambing. He thought the cause of death was that they had been eating stinkwort, as since removing the flock to a paddock free from this weed no deaths had occurred.

Seed Experiments.—Mr. Gallasch tabled good sample of Turkish Giant rock melon grown from Bureau seed.

Kadina, April 5.

Present—Messrs D F. Kennedy (in chair), D. Taylor, J. M. Inglis, Peter Roach, Hy. Johnson, and J. W. Taylor (Hon. Sec.).

Conference of Branches at Bute.—The Chairman and Mr. Johnson gave elaborate and highly appreciative *résumés* of the proceedings at the Bute Conference.

Attendance.—The Chairman remarked upon the neglect of some members to regularly attend the meetings of the Branch. It was absolutely necessary to the prosperity of the Branch that each member should attend the meetings, and they should also come well prepared to bring before the members some practical matter for information and for discussion.

Pyap, April 12.

Present—Messrs. J. Bowes (Chairman), B. T. H. Cox, W. Axon, C. Billett, A. J. Brocklehurst, T. Smith, H. Mills, and J. F. Bankhead (Hon. Sec.).

Reports on Seeds.—The Hon. Secretary tabled a fine specimen of McIvor sugar melon, excellent quality. Messrs. Cox and Bankhead reported Market Champion and Golden Eagle sweet melons as good bearers and good quality. Messrs. Smith and D. Mills said Turkish Giant melon was very inferior. Mr. Bankhead said the Climbing Jap cucumber and Princess Runner were doing very well. Mr. Napier tabled some good quinces.

Live Stock.—Reported that several cattle were affected with bovine ophthalmia, resulting in two cases in total blindness. A case of suspected tuberculosis is to be submitted to the opinion of the Inspector of Stock. The majority of cattle on the settlement are in good condition.

Weather and Crops.—Seeding for cereals has started. Rainfall for March, 1·25in. The grass has started to grow, but the high winds have checked it somewhat. Mr. Axon reported that grubs of a species of Melolontha were greatly damaging his cabbage plants.

Lyrup, April 10.

Present—Messrs. A. Menzies (in chair), O. Klemm, W. F. Healy, A. Weaver, J. Sykes, T. Nolan, A. Pomeroy, T. R. Brown, D. J. Tree, G. A. Bollenhagen, and W. H. Wilson (Hon. Sec.).

Exhibits.—Mr. Menzies tabled broom corn millet, and recommended bending the heads down a fortnight before the seed is ripe to cause the heads to fill and to make the growth better for brooms. He also tabled some Giant Johnson grass (Sorghum halepense, var. giganteum). [The proper name for this is Aleppo grass.—GEN. SEC.] Red Kaffir corn gives heavy heads, and the White Kaffir corn (Dhurra) is liable to blight. He wished to know whether any law would prevent him working his cow.

MANURES WITH SEED.—Mr. Menzies advocated the sifting of commercial fertilisers over the seed whilst it is damp in heaps after pickling, then mixing with a shovel, and thus ensuring the manure being in contact with the seed when it is sown broadcast. Allowance should be made in the handfuls for the presence of the manure, and the lumps should also be broken.

ANNUAL MEETING.—The annual meeting took place on March 18, with eleven members and three visitors present. Chairman reported eleven meetings holden (one special). The average attendance was over eleven, and two visitors. Numerous exhibits staged, four papers read, and many questions discussed and settled. Seeds had been tested and reported upon. Mr. Brown said a mixture of equal parts of carbonate of soda and table salt, dissolved in a little water, is very good for bee stings. [Liquid ammonia rubed on at once is an effectual remedy for bee stings.—GEN. SEC.]

SORE UDDERS.—Mr. R. Brown recommended use of an ointment made with equal parts of oxide of zinc and lanoline or váseline.

VINES.—All members agreed that liberal watering of grape vines during winter is beneficial.

Forster, April 14.

Present—Messrs. A. Johns (Chairman), J. Johns, J. Sears, W. Sears, J. Retallack, F. Towill, J. Childs, C. R. A. Schencher, F. Johns, J. A. E. Schenscher, J. D. Prosser (Hon. Sec.), and two visitors.

SHOW.—Decided to hold a show of products and industries of the district during September next, and to hold a field trial of implements on the day before the show.

Bakara, April 12.

Present—Messrs. H. R. Hayward (Chairman), R. Barrow, W. G. Wilson, J. Roy, F. Martens (Hon. Sec. *pro tem.*), and two visitors.

SHEEP ON FARMS.—Mr. Wilson said every farmer should keep some sheep, so as to be not entirely dependent upon wheat crops. They are more profitable than wheat at 2s. 6d. per bushel. For wool alone he would prefer the Merinos, as they are easy to feed and keep within paddocks, and their wool weighs well and sells well. Where small flocks are kept they should be as nearly pure as possible, as mongrels require as much feed and care as pure breds, and are less profitable.

POULTRY.—Mr. Wilson considers Plymouth Rocks do best with him, but Mr. Roy preferred Andalusians. Mr. Hayward complained that several of his fowls were dying, apparently through poverty, although he gave them plenty of wheat [Try a change of food; give chopped green feed, meat scraps, some fine bonedust, and curdled milk if it is obtainable.—GEN. SEC.]

Yorketown, April 14.

Present—Messrs. J. Koth (Chairman), A. Jung, C. Domaschenz, T. Corlett, G. Bull, J. H. Thomas, and J. Davey (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Members carefully examined the sample sent out by the Chamber of Commerce, and failed to find any bunt or any taint of bunt, while there was only one grain of oats and a few shrivelled wheat grains in it. It was thought to be a fair sample considering the dryness of the past season.

Saltbush Cultivation.—Mr. Jung tabled plant of a Victorian saltbush, about 3ft. in height and full of seed. It was planted in July last year, and had received no special attention or water other than the natural rainfall. It was decided to apply to the General Secretary for seed of Atriplex nummularia for trial on the salt patches.

Bowhill, April 14.

Present—Messrs. A. Dohnt (Chairman), J. Waters, E Weyland, J. Gregory, G. Knight, C. Drogemuller, J. McGlashan, P. A. Groth (Hon. Sec.), and one visitor.

Paper—Mr. Drogemuller read a paper on "Local Industry." Members thought that paring mouldboards on ploughs are beneficial in rough stony country.

Crops.—Mr. C. Drogemuller advised farmers to grow malting barley, sowing not later than April, because good clean samples sell readily at 4s. 6d. per bushel.

Golden Grove, April 12.

Present—Messrs. T. G. McPharlin (Chairman), J. R. Smart, F. Buder, Jno. Ross, W. Mountstephen, J. Woodhead, and A. Harper (Hon. Sec.).

Standard Sample of Wheat—Some discussion took place on the sample sent out by the Chamber of Commerce as the standard for the season 1899-1900. Members carefully examined the sample, and considered it to be very inferior. and below the average of the colony.

Bunt.—Some discussion took place on the efficiency of bluestone pickle as a preventive of bunt. Most of the members favored pickling, but Mr. Woodhead said he never pickled his seed, and got as clean crops as those who did so. He was, however, very particular to sow nothing but seed absolutely free from any trace of the disease.

Kanmantoo, April 11.

Present—Messrs. T. Hair (Chairman). J. Mullins, T. Hawthorne, P. Lewis, J. Downing, J. P. Hair, A. Hair (Hon. Sec.). and one visitor.

"Better Bulls and Fewer of Them."—This was the title of a paper contributed by Mr. F. Lehmann. He suggested that farmers each owning a few cows should combine to purchase a first-class bull, to be cared for by one of them, kept in a secure paddock close to his homestead, not allowed to run with the cows all the year round, probably breaking out and roaming from farm to farm, as some bulls do. By doing this each farmer can to a certain extent control the time of coming in of the cows. After a few years the bull could either be sold or exchanged. In discussing the paper members were agreed that most bulls are fence-breakers, especially the Jerseys or Alderneys. Members who own the largest number of cows prefer to keep their own bull.

Advertising Local Produce.—Mr. Lehmann suggests that some people travel several miles to buy or sell produce, &c., whilst they could have obtained equally good prices or articles at as low cost from neighbors had they been aware that they could do so. He thought there should be a central business place—say the blacksmith's or storekeeper's—where lists of articles for sale or required could be posted up, so that intending purchasers might be accommodated locally.

Giant Aleppo Grass.—Mr. Downing tabled specimen of Sorghum halepense, var. giganteum, grown from Central Bureau seed. The Aleppo grass has incorrectly been called Johnson grass and Phillip's grass (also Panicum spectabile, which name really belongs to the Coapim grass). The improved variety of Aleppo grass is much stronger in growth than the so-called "Johnson grass" usually grown here, which Mr. Mills says is by far the heaviest yielder of fodder that he has tried, only it is a little coarse for feeding. It makes a splendid stand-by in times of drought.

Grasses.—At the previous meeting, March 16th, Mr. W. J. Mills contributed a paper entitled "Some Notes upon South Australian Grasses." He deplored the destruction of our native grasses, principally through overstocking, introduced weeds, and drought, and hoped some one would be able to show how our pastures could be reinstated with some of the most valuable of our indigenous grasses and herbs. He did not know the botanical names, but one of the most valuable of our grasses was known locally as "the little bunch grass." It is better suited for sheep than for large cattle; still large stock will fatten quickly upon it if the pasture is not overstocked. It does not produce seeds that injure the fleece, and sheep thrive wonderfully upon it. When not destroyed by overstocking or drought the roots are perennial and start rapid green growth after rains, even in summer, when all other grasses are dead. To prevent the extermination of the valuable grasses it would be necessary to avoid overstocking, which tramples the soil into a solid mass, besides eating out the plants, root and all; also to remove all stock from at least one paddock each year between March and July, so that seeds may be matured; next stock heavily from end of July until October, or until the geranium seeds fall; from October remove the stock for a month or two so that the bunch grass can produce its seeds. Probably potash manure would aid in the growth of grasses, as they seem to become luxuriant after a fire. He suggested experiments with seeds and manures. Besides bunch grass he would have barley grass and trefoil. Where the dry grass is burned annually on the railway lines it is noted that the bunch grass increases whilst the weeds decrease. This is probably due to the fact that the weeds are annual and their seeds are burned, whilst the grass is perennial and the roots are not killed by the fire. He suggested that leases should contain a provision that a certain portion of the land included should be alternately rested six months each year during the seeding period for the natural herbage and grasses, and that half a year's rent should be remitted once every seven years to compensate for the loss of use of the land. Such an arrangement would be beneficial equally to landlord and tenant. Such reserved portions should be insured against fire.

Standard Sample of Wheat.—Members declined to pass an opinion on this, and will refuse in future to send any wheats for samples until buyers agree to give an extra price for samples going over weight, as they dock for those going under weight.

Rainfall.—For January, February, and March, 3¾in., which is the best record for the first three months of the year in this locality during the past twenty years. Young grass is growing rapidly.

Drills and Manures. - Several drills have been purchased by farmers here, and most farmers are securing commercial fertilisers. Ploughing is in full swing.

Stansbury, April 14.

Present—Messrs. A. Anderson (Chairman), C. Faulkner, H. C. Pitt, P. Anderson, J. Henderson, J. Antonio, P. Cornish (Hon. Sec.), and one visitor.

Exhibit.—Mr. H. C. Pitt tabled nineteen varieties of apples of excellent growth and quality.

WORMS IN HORSES.—Mr. Antonio said one of his horses was troubled with whitish worms, pointed at both ends, and about 15in. long. [Mr. Valentine recommends to give the horse a little areca nut; also a wineglassful of turps in a pint of linseed oil each day for three days.—GEN. SEC.].

Mount Pleasant, April 12.

Present—Messrs. G. Phillis (Chairman), H. Dragomuller, J. F. Miller, H. A. Giles, W. Vigar, J Maxwell, W. Lyddon, P. Miller, and H. T. Hull (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Members consider the sample sent by Chamber of Commerce to be a fair average sample, but with more bunt than usual. Mr. Giles suggested a large cleaning plant at each of the outports for cleaning and grading all wheat exported. Second grade to be retained in the colony for feeding purposes. This would ensure a higher marketable value for South Australian wheat [Would it save anything on carriage to the cleaning plant and back to the farm or other place if each farmer were to clean his own wheat and keep the rubbish at home?--GEN. SEC.].

BROADCAST v. DRILLING WHEAT.—Mr. Vigar reported on his experiment of broadcasting *v.* drilling wheat. Two plots of one acre each were sown side by side on June 17. One bushel was drilled on one plot, and reaped on January 17, yielding 16bush. 35lbs. One bushel was broadcasted at same time on the other acre, and reaped on January 27, yielding 11bush. 25lbs.; showing a gain of 5bush. 10lbs. per acre for drilling. No manure was used in either case.

DISEASED WHEAT.—Mr. Miller tabled sample of wheat in ear, much discolored with what appeared to be a fungoid disease; also a sample of barley.

Elbow Hill, April 12.

Present—Messrs. E. Wake (Chairman), W. Spence, C. G. Ward, H. Dunn, J. Harvey, J. Rehn, G. Wheeler (Hon. Sec.), and five visitors.

BLUESTONE.—Members were pleased to learn that the sample of bluestone sent down for analysis had proved to contain 98·5 per cent. of crystallised sulphate of copper.

ROLLING V. HARROWING OF GROWING CROPS.—The Chairman strongly supported the rolling of growing wheat crops in preference to harrowing, as the harrows were liable to kill many plants unless rain follows soon after. Mr. Rehn had harrowed some wheat last year, but there was no perceptible difference in the crop.

Bute, April 10.

Present—Messrs. W. H. Sharman (Chairman), A. Schroeter, H. Schroeter, J. Birch, A. Sharman, W. Hamdorf, W. Langsford, and M. Hale (Hon. Sec.).

STANDARD BUSHEL OF WHEAT.—Mr. Sharman advocated grading of wheat. No. 1 grade to be 64lbs. or over per bushel, No. 2 to be 61lbs. to 63lbs. per bushel, all under the lowest grade to be docked 1d. per bushel for each pound under 61lbs., and 1d. per pound extra to be paid for each pound over 64lbs. All other members considered the grading too high; but all were agreed that the idea of grading was a good one.

Renmark, April 12.

Present—Messrs. W. H. Waters (Chairman), R. Kelly, F. S. Wyllie, Capt. Moffatt, S. R. Cox, H. Swiney, F. Taylor (Hon. Sec.), and one visitor.

FRUITS.—Mr. Swiney read a paper on the best fruits to grow locally. This brought up a further discussion on the pruning of citrus trees, but opinions were divided, and no decision was arrived at.

Holder, April 7.

Present—Messrs. F. A. Grant (Chairman), F. G. Odgers, H. Blizard, J. Green, E. Jaeschke, H. Vaughan, C. H. Perry, John J. Odgers (Hon. Sec.), and two visitors.

BUNT.—Several subjects connected with the latest issue of the *Journal of Agriculture* were discussed, amongst them being bunt in wheat, and members were agreed that pickling with bluestone solution is a preventive.

Scales Bay, April 7.

Present—Messrs. A. Newbold (Chairman), Geo. H. Newbold, J. J. Roberts, R. S. Thomas, E. R. Aitchison, Chas. Nugent, W. J. Thomas, D. P. Thomas (Hon. Sec.), and four visitors.

OFFICERS.—Mr. J. J. Roberts was elected Chairman, and Mr. D. P. Thomas Hon. Secretary. Past officers thanked.

ADDRESS.—The Hon. Secretary spoke upon the objects and advantages of the Bureau.

STANDARD SAMPLE OF WHEAT.—This matter was discussed at length, but decision deferred until next meeting.

SEEDS.—Seeds of four desirable varieties of wheat received from Central Bureau for trial.

Mount Remarkable, April 12.

Present—Messrs. A. Mitchell (Chairman), G. Yates, W. Lange, T. P. Yates, J. B. Murrell, D. Roper, C. E. Jorgenson, and T. Casley (Hon. Sec.).

BLUESTONE.—Members considered the analysis of the sample of bluestone forwarded by this Branch very satisfactosy.

DAIRYING.—The Hon. Secretary reported that the Jersey bull, Laddie Warwick, was doing well, and his services were liberally availed of by owners of cows in the neighborhood.

Stockport, April 17.

Present—Messrs. G. Burdon (Chairman), C. W. Smith, D. G. Stribling, T. Megaw, J F. Godfree, and J. Murray (Hon. Sec.).

DAIRYING.—The Hon. Secretary reported safe arrival of pure-bred Jersey bull loaned by the department to the Branch.

SELLING AND BUYING WHEAT.—Mr. C. W. Smith read the following paper on this subject:—

Considering the low price of wheat at present and the prospects of continued low prices for years to come, the question of the best means of disposing of the wheat is important. The thought had occurred to him that it would be better to dispose of wheat by auction. He saw no reason why the system that works successfully in regard to wool and other produce should not apply equally as well to wheat. There were several firms of brokers with convenient stores for shipping and handling wool, skins, and the like, which probably would be practically empty for a considerable time after the wool season and at the time the wheat season was on. If these firms would receive and store wheat for sale by auction at a reasonable commission he believed farmers would benefit thereby. If this were done the selling firms could probably grade the wheat and sell according to quality, with the result that there would soon be a decided improvement in the quality of our wheat, and South Australia would regain her position at the head of the wheat-producing countries for quality. A good clean sample was worth more than a dirty or inferior sample, and the buyer at auction would bid accordingly; consequently farmers would have a strong incentive to clean their wheat thoroughly, so as to sell it as first grade. With the auction system it was hardly likely that shippers would have agents in country districts buying wheat for export, and the expenses involved by the wheat passing through two or three hands would be saved, and the farmer benefit accordingly, as the present buyers' commission would nearly, if not quite, cover the cost of the auction system.

Considerable discussion ensued, and it was resolved that this Branch approve of the suggestion contained in the paper, and ask that the matter be discussed by other Branches.

PICKLING SEED WHEAT.—The system of pickling seed wheat two or three weeks before sowing was discussed. Those members who have practised this system thought it better than pickling just before sowing.

Wandearah, April 4.

Present—Messrs. Geo. Robertson (Chairman), E. H. Eagle, T. Joyce, W. J. Fuller, C. Jacobs, W. Davidson, W. Roberts, J. Kurl, W. Munday, L. Stanley, and C. E. Birks (Hon. Sec.).

EXPERIMENTS.—Four desirable varieties of wheats received from Central Bureau were distributed to members. It was reported that the wheats tried experimentally last year had given good results. Hon. Secretary reported that Modiola decumbens had germinated, and was growing well.

Watervale, April 9.

Present—Messrs. E W. Castine (in chair), S. Solly, W. Smith, J. Thomas, W. Field, H. Scovell, B. Perrin, G. Hunter, H. Beck, H. Croft, L. Buring, and E. Treloar (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Members consider that this was a very fair sample of the grain grown in this locality.

EXPERIMENTAL.—Four desirable varieties of wheat were received from Central Bureau and distributed for experimental growing by members.

EXHIBITS.—Mr. G. Hunter tabled good samples of Nickajack, Rokewood, Shepherd's Perfection, and Adams' Pearmain apples.

CODLIN MOTH.—As this district is as yet free from the codlin moth, every one connected with fruit-growing should be careful to scald all second-hand fruit cases directly upon receipt.

Mallala, April 2.

Present—Messrs. H. B. Moody (Chairman), S. Churches, O. Marshman, A. Moody, S. Temby, M. H. East, A. F. Wilson, J. Jenkins, W. Temby, A. W. Stephenson (Hon. Sec.), and thirty-five visitors.

FERTILISERS.—By request Professor W. Lowrie, M.A., B.Sc., Principal of Roseworthy Agricultural College, attended, and gave an address on "Fertilisers." From experience at the College Farm he had been led to recommend the use of phosphatic manures. Nitrogen, phosphoric acid, and potash are the principal constituents of plant food that are liable to be deficient in the soil. Nitrates are easily soluble, and are readily leached out of the soil, but where there is organic matter for the microbes to act upon, the nitrates are being constantly produced. With a moderate amount of moisture in the soil, our high temperature would tend to intensify the activity of those microbes. To secure the necessary moisture in the soil early fallowing is essential in this colony, but similar treatment would not do for Europe, where the climate is wet and cold in winter. Our surface soils are rich in potash, which will take generations to exhaust. It is ridiculous to say that the land will be exhausted by applying phosphates; but should any land show signs of poverty use nitrates. The most favored manure for this district is superphosphate, and the higher the percentage of solubility the better and richer is the manure. The best of bonedust comes in relatively slow in comparison with superphosphate. On limestone soils bonedust is of little value; but on lands which are deficient in lime, and have had a good dressing with farmyard manure, bonedust will be of great value. Black alluvium, with plenty of organic matter in it, will benefit from an application of bonedust. On red soils Thomas phosphate (or basic slag) will answer, but he would advise a dressing of quicklime at the rate of 1 ton or 2 tons per acre. He did not recommend analyses of the soil, because in most cases the land is of a patchy nature. He recommended instead trials of various manures, singly and mixed, in strips, sowing the seed by drill. Land that has rested for years may require phosphates as much as land recently cropped, especially if it had previously been impoverished. Ashes mixed with superphosphate and used at once would be all right, but lime or sea shells will considerably nullify the value of super.; neither is it advisable to mix Thomas phosphate with super., although Thomas phosphate may supersede super. with advantage. Use from 1½cwts. to 2cwts. per acre of super. This would give much better results than a smaller quantity.

Maitland, April 6.

Present—Messrs. H. R. Wundersitz (Chairman), J. W. Shannon, J. Hill, Thos. Bowman, A. Jarrett, J. Smith, O. Treasure, and C. W. Wood (Hon. Sec.).

Standard Sample of Wheat.—Mr. Shannon was of the opinion that the sample forwarded in the sealed bottle was better than the average of this district, and thought there was no reason for all the talk on this subject. The buyers were primarily the cause of the farmers not cleaning their wheat properly, as no more was paid for a clean sample than an average one. Some other members agreed with Mr. Shannon. Mr. Hill said merchants should grade the wheat they purchase, and pay accordingly. He had tried last year, by extra cleaning, to get a higher price, but got no more for it than for wheat less carefully cleaned.

Bearded Wheat for Hay.—In answer to Mr. Shannon, no member has tried King's Early wheat for a hay crop.

Experiments.—Several parcels of wheat for trial were received from the Central Bureau, and handed to Mr. Bowman for sowing and report.

Dry Bible, or Impaction.—Mr. Shannon was almost certain that, if taken in time, this complaint may be cured by the following treatment:—Administer 1lb. Epsom salts; twelve hours later give 1½ pints kerosine with 4ozs. salt dissolved in it; after another twelve hours give 1 pint raw linseed oil, with ½oz. bitter aloes and ½oz. laudanum. This cured a cow of his after it had been given up. Mr. Wundersitz said he had cured two cows by the above treatment.

Millicent, April 5.

Present—Messrs. R. Campbell (Chairman), S. J. Stuckey, H. F. Holzgrefe, A. McRostie, L. Oberlander, H. A. Stewart, W. R. Foster, H. Warland, and E. J. Harris (Hon. Sec.).

The South-Eastern Branches' Conference.—The Chairman reported in highly appreciative terms of the conduct and results of the Conference of South-Eastern Branches at Lucindale, and of the hospitality extended to members of Branches represented thereat. The exhibits of products from all parts of the district were numerous and of excellent quality. [A complete list of these was given in report of Conference in the April issue of this journal.—Gen. Sec.]

Tomatoes.—Members generally reported the season to be a bad one for ripening tomatoes. One grower had about 3 tons of fruit, of which only a few were expected to ripen. [Place them in a warm, dry room, and they will ripen and color up.—Gen. Sec.] Some of the members were sowing seeds now, and intend to nurse the plants through the cold season in the hope to get earlier fruit Mr. Stewart said he would sow seed in August and get ripe fruit before those who were sowing now.

Cyanide Poisoning.—The Chairman said he had tried poisoning of rabbits with cyanide of potassium, but it was an utter failure. It might succeed in waterless districts, but not in the South-East. It is a most dangerous thing to deal with, as the fumes, when it dissolves, are deadly, and the stuff will kill when it gets into cuts or sores. He was surprised that such a dangerous poison could be so easily procured in large quantities.

Repairing Wheat Sacks.—The Chairman said he had seen it stated that holes in sacks could be easily repaired by sticking a patch inside with very stiff flour paste and drying it with a hot flat iron. The patch could be stitched around afterwards if necessary.

Rainfall.—For March—Millicent, 2·39in.; for Mount McIntyre, 2·99in.

Arden Vale, April 6.

Present—Messrs. A. Hannemann (Chairman), M. Eckert, C. Pearce, G. Miller, L. Warren, A. W. Fricker, E. H. Warren (Hon. Sec.), and five visitors.

Wheat Experiments.—Mr. Pearce reported favorably of Bartlett's Crossbred wheat, but Indian King was inferior, producing a small head with very flinty grain. The Hon. Secretary reported that from 1bush. of Bartlett's Crossbred, sown on well-worked fallow, he obtained a yield of 19bush.; the variety was not more prolific than Steinwedel, but it did not shake out.

Bunt.—This much-debated question was again discussed, but no finality of opinion appears obtainable. Mr. Miller stated that he pickled some "smutty" wheat, using 1lb. of bluestone to the bag, and leaving the wheat in the solution for two hours; still the crop was badly affected by bunt. It was elicited in the discussion that the seed was put back into the original bags, and consequently the effect of the pickle was nullified, owing to the spores in the bag re-infecting the seed. Mr. Pearce knew of an instance where wheat pickled about six weeks before sowing produced a comparatively clean crop, while seed freshly pickled and sown under same conditions gave a badly affected crop. Mr. Fricker held that the spores of bunt would be destroyed by the bluestone pickle, but thought it was possible the seed got re-infested from bunt balls left amongst the grain.

Farmers' Emergency Fund.—The Hon. Secretary initiated a discussion on this subject. He suggested that such a fund should be established, or in lieu thereof the members of the Branch Bureaus should act as a Vigilance Committee to relieve unavoidable distress amongst their fellow farmers. The matter was discussed at length, and the Hon. Secretary agreed to bring forward a detailed scheme, having local application only, and confined mainly to subscribers.

Field Trial.—It was decided to write to Quorn and Richman's Creek Branches suggesting arranging for field trial of various disc implements during the winter.

Morphett Vale, April 4.

Present—Messrs. L. F. Christie (Chairman), J. Bain, F. Hutchinson, J. McLeod, J. Depledge, F. Anderson, A. Jones, A. Pocock. and A. Ross Reid (Hon. Sec).

Standard Sample of Wheat.—Members considered the samples sent out by the Chamber of Commerce to be badly cleaned, "smutty," and generally inferior to the sample produced in this district.

Bushel of Fruit.—In answer to question, Mr. Hutchinson said a bushel of quinces, apples, or pears should weigh 40lbs , and of stone fruits 60lbs. [An average bushel case of good keeping apples will go about 42lbs. per bushel, though 40lbs. is regarded as a bushel of apples. Plums, which will weigh from 56lbs. to 60lbs. and more per bushel, peaches, apricots, and nectarines will not average more than 48lbs. to 50lbs.—Gen. Sec.]

Bird Pests.—It was decided that two members of this Branch join the deputation from Reynella Branch of the Vinegrowers' Association to the local district council, urging that a special rate of 1d. in the pound be imposed for the purpose of paying for the destruction of sparrows, starlings, goldfinches, silvereyes, and wattle-birds. Members would like other Branches to discuss this matter of the destruction of sparrows, &c. [As a result of the action of the Branch and the Vinegrowers' Association a special rate of 1d. in the pound upon all ratable property in the district has been struck, and in addition the vinegrowers have agreed to contribute 2d per acre per annum, to be added to the sum raised by the special rate. In this way about £26 will be available in this district for payment for destruction of feathered pests. This example might be followed in other districts with benefit to all concerned, but care must be exercised that payment is not offered for the destruction of useful birds.—Gen. Sec.]

Pine Forest, April 10.

Present—Messrs. R. Barr, jun. (Chairman), G. Inkster, A. Mudge, J. Phillis, and F. Masters (Hon. Sec.).

Field Trials and Shows.—Members were opposed to proposal of Mundoora Branch to enlarge the scope of the annual produce and industrial show, as they were of opinion that a field trial and show at Mundoora would interfere with the success of the trial to be held under the auspices of the Bureau Field Trial Society at Bute. They were also unfavorable to multiplying the number of these trials, as one good large field trial would be of more value to the district generally than several local trials. The members were not in favor of proposal to hold field trials in connection with the Bureau Field Trial Society only in alternate years, as they thought it better for all concerned to keep them as annual object lessons to the agriculturists of the district.

Adulteration of Bluestone.—The Hon Secretary initiated a discussion on this subject. He believed in legislating to protect any class of individuals against injustice if within reasonable possibility. As farmers it was imperative that the proved remedy for bunt—pickling the seed in bluestone solution—should not be neutralised by unscrupulous and careless tradesmen or manufacturers. At present they had practically no remedy in regard to adulteration of bluestone, and it has often been asserted that the farmer often gets a material valueless as far as his needs instead of bluestone, and in consequence does more harm than good pickling his seed wheat. It was considered necessary to protect users of fertilisers against fraud, and why should not the same be done in regard to articles used for prevention of disease in cereals, fruit trees, &c.? The legislator who helps to place bluestone under similar legislation as applies to fertilisers would confer a great boon on the farming community, as the results derived from all the care and expense in cultivating, manuring, sowing, etc., may hinge upon the treatment of the seed with genuine bluestone. No one but the careless or fraudulent dealer or manufacturer would be affected by such legislation. The results of the analyses of samples of bluestone sent in to the Central Bureau showed that bluestone was sometimes adulterated, and he considered the Bureau had done great service to the farmers in the action they had taken in this matter. Considerable discussion ensued. Mr. Inkster attributed the bunt in his crops to using inferior bluestone. He noticed that good bluestone corroded the shovels &c., very quickly, but last season the bluestone he used scarcely affected the shovels at all. It was resolved that this Branch indorses the remarks of the Hon. Secretary, and records its appreciation of the action of the Central Bureau in having samples of bluestone analysed.

Lipson, April 14.

Present—Messrs. S. F. Potter (Chairman), Geo. Provis, J. Wishart, W. F. Darling, H. Brougham, Chas. Provis, Geo. Carr, R. Haldane, J. McCallum, E. J. Barraud (Hon. Sec.), and two visitors.

Wheat Experiments.—Mr. G. Provis tabled samples of Indian King and White Monarch wheat. The latter was too late for an early district, but the former should prove suitable for this district.

Gawler River, April 18.

Present Messrs. J. S. McLean (in chair), T. P. Parker, F. Roediger, A. Bray, and H. Roediger (Hon. Sec.).

Standard Sample of Wheat.—Members considered the small sample contained in the sealed bottles was decidedly superior to the sample received direct from the Chamber of Commerce, being freer from bunt balls and seeds of oats, drake, &c. They considered it would be better to adopt two fixed grades, say 65lbs. and 62lbs. per bushel, as proposed by Professor Lowrie, as it would induce farmers to clean their wheat better, with the result that our wheat would fetch a higher price in the English market.

Moth in Dried Fruit.—Members wished to know if there was any method to prevent the small caterpillars attacking dried fruits and the best way to destroy them in the fruit. [Subject the fruit to a temperature of 240° F. for ten minutes; pack it firmly in boxes and place it in a room where moths cannot find entrance to deposit their eggs.—Gen. Sec.]

Fruit Pests.—Mr. Bray directed attention to the fact that certain prominent nurserymen were advertising new varieties of trees imported from other countries. Members understood the importation of fruit trees was absolutely prohibited, and wished to know whether these new varieties were introduced by special permission of the department or in an illicit manner. [The importation of rooted fruit trees is absolutely prohibited, but scions may be imported by nurserymen through the Inspector of Fruit and under special restrictions as to inspection and fumigation considered necessary in the interests of the fruitgrowers of the colony.—GEN. SEC.]

Arthurton, April 12.

Present—Messrs. W. Short (Chairman), W. H. Hawke, M. Lomman, J. Koch, C. L. Palm, J. W. Parker, T. Baldock, J. B. Rowe (Hon. Sec.), and one visitor.

CONFERENCE.—Mr. W. H. Hawke reported on proceedings of Conference of Branches held at Bute.

STANDARD SAMPLE OF WHEAT.—A discussion on this subject ensued. Members were all of opinion that sufficient inducement was given by the buyers and millers of wheat to encourage the proper cleaning of wheat to raise it to a higher standard, but something should be done to try and regain the proud position once held by South Australian wheat in the markets of the world. A motion favoring the ressolutions *re* adoption of fixed standards for wheat, passed at the various Bureau Conferences, was carried.

PLOUGHING.—The Hon. Secretary reported on trials made by himself in striking out and forming the crown for ploughing. When striking out with a four, five, or six furrow plough do not take up the off front wheel as is usual, but go on the same as if it were up, and when backing up run the off front wheel in over the second or third furrow. The crown or ridge will be very little above the other ploughing; but the ground will all be ploughed, though of course not quite to its full depth. This is not usually the case at the ploughing matches, as 14in. to 16in. is simply covered but not cut. This matter should receive attention in connection with the Field Trial Society's contests. Members were of opinion that at such contests the implements should do work similar to what would be done by a good farmer, so that it would be educational to the young or inexperienced farmers.

MANURING FALLOW LAND.—Mr. Lomman asked for opinions of members on the practice of working the fertilisers into the soil during or soon after fallowing. Mr. Hawke thought the phosphates would lose much of their solubility lying in the ground so long, but advised it as an experiment. It was decided to ask Professor Lowrie's opinion on the matter.

RAINFALL.—Recorded at Winulta for March, 2·66in.: at Tiparra, 2·25in.

Forest Range, April 12.

Present—Messrs. J. Vickers (Chairman), J. G. Rogers, R. Townsend, S. Collins, W. Cherryman, O. Kummnick, J. Caldwell (Hon. Sec.), and three visitors.

BEST SORTS OF APPLES.—Mr. A. Green contributed a paper to the following effect:—

It is not possible to decide which are the best apples to grow in all places, because a variety that will color beautifully and develop an exquisite flavor in one locality will not be worth anything in another place. Each district must therefore produce those sorts that are best suited by its local circumstances. For Forest Range district the Early Margaret, Astrachan, and Gladstone are hard to beat amongst the early varieties. Following these, later on come William's Favorite, Newman's Seedling, Worcestershire, and Summer Pearmain. Then follow the late keepers, of which there is a good number. Probably Jonathan would come first for choice, followed by Dunn's Seedling (and Cleopatra, if they can be grown clean, otherwise they will waste heavily), Rome Beauty, Buncome, London Pippin, Hoover, Esopus Spitzenberg, Strawberry Pippin, Garibaldi, Nickajack, Rokewood, Lord Wolseley, and King of Tomkyns County. This does not include all the best sorts; and it would be necessary also to grow good some cooking varieties. Northern Spy is a good sort to grow if the locality is suitable to cause heavy bearing.

Mr. Vickers liked the Northern Spy if it could be got to bear well; Garibaldis are shy bearers. Marguerites are good and early, but fall off. He would only plant Cleopatras or Dunn's Seedlings where the soil is light and dry; as a rule they are a failure in this locality. Better color is secured where trees are planted on poorer soil. Mr. Collins found he got as large a return from London Pippins as from any variety, and Ridgway's Red is a good reliable sort. Some members found Nickajacks shy bearers, whilst others found them prolific. Scions or buds should only be taken from trees which have been proved to be heavy croppers. Jonathan is excellent in most places, though in some it does not color up so well as it does here. The following were selected as best for this district:—Marguerite, Red Astrachan, Jonathan, Empress (or Alexander), Dunn's Seedling, Ridgway's Red, London Pippin, and Stone Pippin.

Tatiara, April 24.

Present—Messrs. T. Stanton (Chairman), T. Hall, R. Scown, H. Killmeir, G. Milne, F. Smith, C. H. W. Wiese, R. Penny, and W. E. Fisher (Hon. Sec., *pro tem.).*

KING'S EARLY WHEAT.—Mr. Milne considered this wheat unsuitable for the Tatiara district, but some of the seed was apparently damaged by heating. Mr. Wiese sowed some alongside Purple Straw, and reaped 3bush. per acre more than from King's Early. Members generally agreed that King's Early will not become a favorite in Tatiara.

STANDARD BUSHEL OF WHEAT.—Members were agreed that the "fair average quality" sample of the present season's wheat sent home by the Chamber of Commerce is greatly inferior to the wheat grown and sown locally. Those farmers who thoroughly clean wheat should have better prices than those who are careless in that matter. A resolution was adopted that the Chamber of Commerce should obtain a greatly increased number of samples; that 3lbs. ought to be quite sufficient, and urged that all Branches should see that reliable samples of the season's product should be sent.

Mannum, April 24.

Present—Messrs. J. G. Preiss (Chairman), R. Heidrich, T. W. Kowald, J. Nichels, G. Lenger, J. W. Walker, A. Faehrmann, E. Schutze, J. L. Scott, J. A. Schutze, H. Brown (Hon. Sec), and one visitor.

CHANGE OF SEED.—It was generally agreed that a change of seed wheat, etc., is desired.

COMPARISONS OF COMMERCIAL FERTILISERS.—Members discussed the comparative values, &c., of some of the fertilisers on the market. They thought the "English super." of the United Alkali Co. gives a minimum of trouble in drilling. Much of the costly superphosphates is lost through the bags becoming perished, and there is room for great improvement in the method of delivery to the farmers.

BRANCH SHOW.—Resolved, to hold a show of agronomical and industrial products on October 4.

Minlaton, April 24.

Present—Messrs. John Anderson (Chairman), H. Martin, J. Martin, H Boundy, and H. J. Correll (Hon. Sec).

Feeding Horses.—All members agreed that when a portion of the farm horses' feed consist of wheat-chaff and oats they thrive better than when fed upon hay only. To prevent a horse "bolting" his oats a member said that a number of small marbles in the feed-box is effective.

Sore Shoulders.—Mr. J. Anderson said he had found a solution of sal ammoniac very effective in cases of sore shoulders in horses.

Wool-classing.—An endeavor is being made to form a class for wool-sorting under the direction of Mr. Jeffrey.

Inkerman, April 10.

Present - Messrs. D. Fraser (Chairman), S. Diprose, W. Board. J. Lomman, E. M. Hewett, and W. A. Hewett (Hon. Sec.).

Experiments.—Four varieties of wheat were received from Central Bureau and several others from members. The Hon. Secretary undertook to sow these side by side under similar conditions, so that members can visit the plots and compare results.

Standard Sample of Wheat.—Members consider that the average of wheat grown this latest season is much better than the sample sent off by the Chamber of Commerce, and they appreciate Professor Lowrie's efforts to secure an alteration in this matter.

Mount Compass, April 14.

Present—Messrs. M. Jacobs (Chairman), R. Peters, W. Gowling, S. Arthur. R. Cameron, F. McKinlay, F. Slater, A. J. Hancock (Hon. Sec.), and three visitors.

"Possible and Profitable Cultivation."—Mr. Slater read a paper under this heading to the following effect:—

To attack scrub, sand, and swamp lands in this or similar localities a man requires a deal of pluck, endurance, and some capital. He must carefully consider how to do the best and the greatest amount of work with the smallest expenditure of labor. Where possible the plough must supersede the mattock and the spade, and then grow or produce the largest quantity of everything that can be readily sold at the best prices going. It was, therefore, a great mistake to grow potatoes exclusively. The error is very apparent when small crops and low prices are prevalent. But potatoes and onions must be staple crops, because so readily saleable. The cow will come as the next best and most readily available source of income; but she must be well fed, well attended to, and well housed. Owing to the scarcity of grass it is necessary to grow food for her. For summer and autumn sow maize, all varieties of sorghum, etc., lucern, beets, mangolds, carrots, and parsnips. For winter feed sow at end of autumn barley, oats, wheat, kale, rye, cattle cabbages, swedes, turnips, kohlrabi, Dwarf Essex rape, and Broadleaf mustard. It is necessary to have several sorts, since to confine an animal to one kind of food is bad policy at any time. The "chats," or small potatoes, are good for cows and increase the flow of milk. Skimmed milk is good for pigs, and a few of these should be kept to profitably use up much food that would otherwise go to waste. They will eat anything that a cow will eat, and many things besides. The fine-haired pigs appear to be the easiest to keep, but they must be well housed. Grow peas, beans, pumpkins, pie melons, &c., additionally for the pigs. They should be allowed to run in the open paddock as much as possible, where half the food will give better results than double the quantity given to pigs confined in sties and wallowing in filth. A few fowls should be kept, not so much as a source of income, but in order to reduce the cost of living. Good food is conducive to good temper, and eggs, milk, and bacon contribute to maintenance of good humor. A deal of food good for fowls can be grown, such as cereals, peas, sunflower seeds, millets, &c., in addition to the large quantity of green stuff, of which they are so fond. They must have good shelter in winter. Minorcas and Leghorns are amongst the best for egg-production. Ducks cannot be recommended for this locality. Geese require pasturage, which is not available, and turkeys are such ramblers that trouble might be caused thereby amongst neighbors. Now that the swamp lands have become drained and firm enough for horses to work on them it will be necessary to grow some feed for them. Directly the potatoes are harvested sow seeds thinly for hay, so that it shall have time to stool out well. Perhaps hops may pay to grow, but some should be tried first for home use, and later on co-operation may establish kilns for drying. There is a large demand for sage and thyme. Osiers could be grown profitably for sale and also for windbreaks. Mustard, hemp, canary seed, and many other plants should be tried experimentally. Walnuts and fruit trees should be grown wherever possible outside the main crop. Finally, it is necessary always to grow and keep only the best of everything, to cultivate and to feed liberally, and to shelter all crops and animals against the inclement extremes of wind and weather.

Black Spot in Potatoes.—Mr. Cameron wished to know whether seed affected with black spot would be perpetuated in the resulting crop of potatoes. [Undoubtedly, but in a more virulent degree.—Gen. Sec.]

Seasonable Recommendations.—Sow turnips, swedes, mustard, and almost any green crop.

Dowlingville, April 12.

Present—Messrs. R. A. Montgomery (Chairman), J. Phelps, T. Illman, J. L. Broadbent, S. W. Tee, J. Birkin, T. Lombladt, R. Foggo, H. P. Crowell, Geo. Mason, F. W. Roberts (Hon. Sec.), and one visitor.

Grub Pest.—Mr. Foggs showed specimens of grubs, which in numbers were attacking his newly-sown wheat. They confined their attention solely to plants growing on the red land, and completely cleared off the seed.

Standard Sample of Wheat.—Members consider the sample sent by the Chamber of Commerce to be a fair average of the quality of present season's crop.

Richman's Creek, April 23.

Present—Messrs. W. Freebairn (Chairman), J. M. Kelly, A. Knauerhase, A. Nicholson, W. J. Wright, M. Hender, and J. McColl (Hon. Sec.)

Field Trials.—Arden Vale Branch asked support of Branch to endeavor to arrange for field trial of disc-cultivating implements. It was resolved that Branch give its support in securing a field trial of improved implements such as ploughs, harrows, and scarifiers.

Improved Implements—The Chairman gave a report on the implements and machinery at the Adelaide Show. He particularly noticed one of Martin and Co.'s strippers; the near wheel was fixed close to the machine and the flywheel on the outer side of it, which he considered would improve the draught and put more weight on the large wheel. He did not consider the alteration in method of raising and lowering the machine an improvement.

Seed Experiments.—The Hon. Secretary reported the Bartlett's Crossbred wheat yielded 3bush. from 4lbs. sown; it was blighted a good deal by hot winds, and the grain was pinched; he proposed to give it a further trial. Eight ounces of Indian King wheat returned 30lbs. grain; it was rather flinty, but the heads were well filled, and may improve under cultivation. Sorghums were a failure, also marrows and melons.

Agricultural Statistics.—Mr. Kelly called attention to a statement in the Press as having been made by Mr. C. H. Connor that the official statistics were unreliable, as farmers often did not give a true statement of their returns, because they were afraid the Taxation Department might make use of them to their disadvantage. Such a statement was absolutely uncalled for, as it was untrue. Other members agreed that the statement was unwarranted, and that while admitting that the statistics were not so reliable as they might be, the farmers were not altogether to blame. The fact that three members present at this meeting had not been asked to furnish returns this year showed that some of the fault at least lay elsewhere.

RAINFALL.—Recorded by Mr. W. Freebairn: January, 0·23in.; February, 0·41in.; March, 2·08in. By Messrs. McColl: January, 0·19in.; February, 0·16in.; March, 2·59in.

Burra, March 30.

Present—Messrs. F. A. S. Field (Chairman), Jos. Flower, J. A. Arnold, Jas. Scott, Eli Goodridge, and R. M. Harvey (Hon. Sec.).

WOOL-CLASSING.—Mr. G. Jeffrey, Woolclasser to School of Mines and Industries, agreed to deliver a public lecture on wool-classing on May 15, under the auspices of this Bureau, and it is expected that a good class will be formed to attend a course of lectures on wool-classing.

STANDARD SAMPLE OF WHEAT.—Some of the members considered the sample sent out by the Chamber of Commerce to be very inferior. It was thought that for the central wheat-growing districts at least it would be fairer to adopt two grades as in America.

Yankalilla, April 19.

Present—Messrs. E. C. Kelly (Chairman), G. Newbold, H. Leverington, J. Tonkin, J. Gardner, and G. H. MacMillan (Hon. Sec.).

PICKLING WHEAT.—Members approved of the General Secretary's suggestion for pickling wheat, as illustrated in March issue of *Journal of Agriculture*.

MANURES.—All the members referred to profitable results obtained by them rom the use of the drill and fertilisers.

Meningie, April 21.

Present—Messrs. M. Linn (Chairman), Jabez Williams, C. J. Shipway, T. W. R. Hiscock, H. May, W. Tiller, W. J. Botten, A. J. Myren, S. F. Robinson, and H. B. Hacket (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Members considered the sample to be inferior and the present system was not fair. The farmer who worked his land properly and produced a good clean sample lost owing to the mixture of inferior samples when fixing the standard. It was resolved that the Branch favors the suggestion of Professor Lowrie that there should be two fixed grades.

DISEASED PIGS.—The Hon. Secretary reported having forwarded a pig to Adelaide for examination by the Chief Inspector of Stock and the Government Veterinary Surgeon. He had received report from the General Secretary that, although a careful *post-mortem* examination had been made, no disease or parasites which would cause the weakness in the hindquarters could be detected. Considerable discussion ensued, and members thought it strange that no reason for the complaint could be given. The Hon. Secretary advised that pigs should never be fed solely upon separator milk, while Mr. Williams would not give it them until they were five or six months old. Some members attributed the trouble to the use of separator milk, but others pointed out that animals which had not been fed on this milk were affected.

SEED AND FERTILISER DRILL.—Offer of loan of seed and fertiliser drill for experimental work was considered to be too high, and as season was advanced it was decided to take no further action for the present.

HERBS.—Mr. May wished to know proper time to cut sage and thyme; he cut his plants back whilst in flower and they afterwards died. [Cut them before they flower and dry in a shady place.—GEN. SEC.]

Clarendon, April 12.

Present—Messrs. J. Spencer (in chair), J. Wright, R. Hilton, J. Piggott W. Spencer, J. Chapman, W. Henty, and A. L. Morphett (Hon. Sec.)

POTATOES.—A discussion took place on the articles in April issue of *Journal of Agriculture* on cultivation of potatoes. It was agreed by most of the members that 1½oz. setts were usually the best to plant.

APPLE-GROWING.—It was decided to obtain specimens of the best varieties of keeping apples grown in the district, with their proper names.

QUESTION BOX.—It was decided to adopt a question box, and deal with questions asked at each meeting.

Eudunda, April 17.

Present—Messrs. C. Wainright (in chair), E. T. Kunoth, A. Kluske, A. D. Weil, J. A. Pfitzner, E. Schier, H. Martin, and W. H. Marshall (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Members expressed surprise at the sample sent out by the Chamber of Commerce as the fair average sample of South Australian wheat for 1899-1900. The sample for this district was considered to be far superior to the standard sample. Members were unanimously of the opinion that for a season like the last the fair average sample for this colony should not have weighed less than 64lbs. per imperial bushel.

SUMMER FODDERS.—Mr. Kluske tabled splendid samples of Amber cane and Johnson grass.

WHEAT EXPERIMENTS.—Mr. A. Schiller reported having sown 1lb. Bartlett's Crossbred wheat on April 4, 1899, but the frost damaged the wheat, and he only got back 12ozs. of grain. Mr. F. Hinty sowed 1¼lbs. and reaped 10¼lbs.; the wheat grew well considering the season.

Balaklava, April 14.

Present—Messrs. P. Anderson (in chair), W. Crawford, A. Manley, W. H. Thompson, A. Hillebrand, W. Smith, A. W. Robinson, G. Reid, E. Hains, and E. M. Sage (Hon. Sec.).

BLUESTONE.—Members expressed satisfaction at result of analysis of sample of bluestone forwarded to Central Bureau by this Branch. The sample, which the Hon. Secretary stated was Wallaroo bluestone, contained 98·9 per cent. of pure crystallised sulphate of copper.

STANDARD SAMPLE OF WHEAT.—Members considered that if the small sealed bottle sent out by the Central Bureau contained a fair representation of the sample adopted by the Chamber of Commerce as the average for the season there was very little cause for complaint, and was much superior to what they had expected to find from the remarks of Professor Lowrie and others. Mr. Robinson said he had seen wheat grown at Roseworthy College little (if any) better than this sample.

FALLOWING AND MANURING.—Mr. Robinson read paper by Mr. Feuerheerdt, of Lucindale, on this subject. Members considered that the advice given to farmers was very good, and all agreed as to the necessity for getting the fallowing done as early as possible.

SEED EXPERIMENTS.—The Hon. Secretary reported very favorably of McIvor sugar watermelon, grown from Bureau seed. He tabled one of the fruits, weighing 13lbs., which was sampled and much appreciated by members. The first sowings were destroyed by frost, and the patch had to be resown late in October, so they had not a fair chance. He considered this variety the best he had ever grown.

Koolunga, April 12.

Present—Messrs. T. B. Butcher (Chairman), J. Button, R. Palmer, R. Lawry, E. J. Shipway, J. Pengilly, W. T. Cooper, R. Jackson, R. H. Buchanan, and G Pennyfield (Hon. Sec.).

PICKLING SEED WHEAT.—Mr. Buchanan advocated pickling, but before rain falling he sowed without pickling. Mr. Palmer used the drill last year with pickled seed, and had a bunted crop for the first time in seven or eight years. [You should have removed the bunt balls from the seed. They were "smashed" in the drill, and re-infected the seed.—GEN. SEC.] Several members said they always pickled, and never suffered loss from bunt Mr. J. Pengilly uses 4ozs. bluestone for each 4bush. of seed, and pickles in a tub, and thought seed should be pickled several days before sowing. He had pickled very "smutty" seed and got a clean crop from it. Mr. Butcher had no faith in pickling, and held that if bunted seed were sown a bunted crop would result.

Penola, April 13.

Present—Messrs. E. A. Stoney (Chairman), T. H. Morris, J. T. Morris, J. W. H. Sandiford, W. Miller, W. P. Davis, Dr. F. Ockley, and L. W. Peake (Hon. Sec.).

WOOL-CLASSING.—Endeavors to be made to establish a wool-sorting class under tuition of Mr. G. Jeffrey.

APPLE TREES.—Mr. E. A. Stoney tabled some apples spotted with vivid carmine blotches, and leaves of apple trees which had been gnawed, probably by Otiorrhynchus sulcatus (Curculio beetle). The carmine spots were most probably caused by exposure to cold, wet, and wind.

Gumeracha, April 23.

Present—Messrs. D. Hanna (Chairman), W. Cornish, J. Monfries, W. V. Bond, W. A. Lee, Dr. Stephens, T. W. Martin (Hon. Sec.), and one visitor.

FARM MILK SEPARATORS.—Mr. W. A. Lee read the following paper on "Farm Separators, and their relation to the Dairy Industry":—

With the improved methods of dairying inaugurated by the use of the separator and the factory system of butter-making the industry has advanced rapidly in the Australasian colonies. The export of butter is now very considerable, the quality being generally good, but complaints have been made recently that the quality of some of the butter has deteriorated. Much has been written and various theories advanced as to the cause, one of the strongest being the farm separator, and I think with some cause, although only indirectly, the real fault being in keeping the cream too long before forwarding to market. Under the factory system it is generally agreed that the whole of the milk of a large district being handled at one central place will result in the production of even and first-class butter. In our own district we have never produced a better article than when the milk was separated twice per day, but when milk in many instances has been forty-eight hours old and more it has deteriorated in several ways, and was not satisfactory either to supplier or manager, the first getting a lower test for his milk and the latter inferior butter. In dealing with this matter my object in writing is not to advocate either the claims of the factory system or the farm separator, but to try and point out how they may be worked together to the best interest of the dairy farmer. We cannot shut our eyes to the fact that farm separators are on the increase, and we believe that if our butter has deteriorated through using the farm separator it is not the fault of the separator, but through keeping the cream too long before sending to market, and often exposed for many hours on the roads to all conditions of temperature, resulting in an inferior quality of butter unsatisfactory to all parties concerned.

A Victorian writer says the real cause of the deterioration in butter is the competition of public factories, which takes cream of any quality, and does not insist on its being brought to the factory within forty-eight hours of separating. It is well known that cream rapidly deteriorates after twenty-four hours Some contend that the difference in price is caused by the increased number of individual lots of butter being placed on the market resulting from the home separator, others by the increased supply.

A Victorian expert maintains that there is no deterioration, but with the increased supply of any commodity buyers are always prone to find faults that are not noticed when the demand is brisk. To sum up, whatever may be the cause of deterioration (if any) the main point is to produce the best article possible, and we think in the case of the farm separator can be best attained by delivering the cream to the factories for making up, thereby ensuring a uniform article.

It may not be out of place here to say a word or two on the management of cream. The best results are obtained by separating the milk as soon as possible after milking, the separator being first warmed by pouring hot water into the bowl, an even speed kept up, and about 10 per cent. taken off as cream. This will vary according to the quality of milk and the temperature. The cream should be set aside in earthenware or tin utensils in a cool well-ventilated building, and when any addition to the cream is made the whole should be well stirred, and afterwards delivered to the factory two or three times per week. Every individual sample should then be examined by the manager, its condition noted, and a portion set aside for testing, or, if necessary, churned. In dealing with the percentage of butter fat in a given quantity of cream there is a variation in the time of year, and even in a week, so that the time is past for anyone to pay equal prices for cream supplied to a factory, and weekly tests are therefore absolutely necessary. I think it would be an advantage if an officer of the butter factory could inspect the dairies and premises of their patrons with a view to giving advice, if required, on dairying matters. Dairying is only in its first stages with us as yet, and we have all much to learn; but with care and thorough cleanliness, and attention to details, butter can be produced in this and other districts similar to ours equal to any in the colonies, and will take a foremost place in the markets of the world.

Port Elliot, April 28.

Present—Messrs. J. McLeod (Chairman), J. Brown, J. Nosworthy, W. E. Hargreaves, J. Lovell, J. R. Coote, J. Davidson, F. T. Fischer, and E. Hill (Hon. Sec.).

Sowing Wheat.—It was concluded that the best time for sowing wheat in this district is during the last half of May. Most of the members prefer to pickle seed in a heap with bluestone solution, but a few favor pickling in a tank or cask.

Hay.- Mr. Fischer advocated use of 1cwt. of salt and 1cwt. of guano per acre as a manure for hay. With this on a mixture of seed in proportion of one part wheat and two of oats he had cut 3 tons of chaff per acre from a paddock of twenty acres.

Too Much Lime?—In answer to a question as to why crops go off on the sites of old aboriginal camps along the seacoast, the answer was given that the continuous cooking of shellfish and burning of the shells had introduced too much lime. [Is it possible that the soil has been kept continuously impoverished by the burning and destruction of organic matter on the site of the fires during hundreds of years?—Gen. Sec.].

Lucindale, April 28.

Present—Messrs. A. Dow (in chair), J. Riddoch, H. Langberg, W. Dow, A. Carmichael, G. C. Newman, J. Bourne, L. McInnes, A. Matheson, and E. E. Dutton (Hon. Sec.).

Conference.—Mr. A. Caldwell, of *Naracoorte Herald*, was thanked for free printing and advertising in connection with the late Conference of South-Eastern Branches at Lucindale.

Experience with Sheep and Wool.—Mr. A. Carmichael gave an interesting account of his experiences with sheep and wool in this colony since 1860, to the following effect:—

He had been used to sheep in the Highlands of Scotland, and was impressed at the splendid quality of the sheep north of Adelaide, both in frame and fleece—especially at Canowie. About 18[illegible]5 he saw an experiment tried near the Lakes with Negretti rams for improvement of Merinos, but the result was an utter failure. Then some pure Merinos from Lake Learmonth were tried, and a wonderful improvement took place. These rams were sent by ship, but another lot from the same place which had been travelled overland to Naracoorte appeared quite inferior until they had been kept in a good paddock for a time, when they turned out to be as good as the first lot. This showed the importance of good feed. The progeny of these sheep were bare about the points, which he thought was not a great fault, as they were otherwise very good. If a sheep has a good topknot it is sufficient, so long as he is good on the body, as the wool off a sheep's legs is inferior, and if very woolly about the eyes it starves if not in good country. In 1880 he came to this district and started with 700 Merino ewes and five selected rams from Morambo. The progeny deteriorated in size, so he crossed with Lincoln rams, and then returned to Merino rams, thus securing a Merino fleece on a crossbred frame. He had kept the same strain of blood for twenty years, and could show fleeces which most people would affirm to be Merinos, whereas he was sure they were comebacks. For the country he occupies he finds the comebacks the more profitable, as it has a larger frame and stronger constitution than the Merino.

Mr. L. McInnis did not agree with the comebacks. The first cross is the best, for if crossed again with Merino the progeny deteriorate in size. The best Merinos are the most profitable. His brother's flock of Merino sheep is famous in the South-East. Mr. Carmichael said if the country were suitable, as it is about Naracoorte, Merinos would be best, but in country like his own the crossbreds do better than pure sheep.

Reports on Seeds.—Mr. L. McInnis received 1oz. Dart's Imperial wheat three years ago, and has now about seven bags (equal to 28bush.), but very much bunted. Mr. H. Langberg, from same amount of seed at same time, has raised six bags of clean wheat It ripens a fortnight earlier than other kinds.

Amyton, April 12.

Present—Messrs. Joseph Gum (Chairman), Thos. Gum, Wm. Gum, H. Turner, W. Mills, A. Gray, H. Gray, James Gray, R. Brown, S. Thomas (Hon. Sec.), and one visitor.

Drill v. Broadcast Seeding.—In discussing Mr. Borgas's paper, as read at Quorn Conference, members noted that wheat drilled, even without any manure, gave considerably better results than that broadcasted; whilst wheat drilled with manure gave even better results. After deducting cost of ploughing, sowing, harrowing, reaping, &c., the broadcast fields gave no profit; whilst those sown by a drill with manures gave a profit of 5s. per acre.

Standard Bushel of Wheat.—Members unanimously support Professor Lowrie's contention that there should be a constant standard for South Australian wheat, graded to No. 1 and No. 2.

Fallow.—Fallowing should be commenced immediately after seeding is finished, and should be cultivated sufficiently afterwards to kill the weeds. If the land is dry the less it is worked the better.

MISCELLANEOUS NOTES.

Miss Eleanor Ormerod, LL.D., F.R.M.S., and a dozen other scientific titles and degrees, all thoroughly well earned, and not merely complimentary, has just favored this *Journal* with a copy of her latest "Report of Injurious Insects and Common Farm Pests during 1899, with Methods of Prevention and Remedy." This is the twenty-third annual report published by the highly-talented lady, whose scientific merits have just been recognised by the University of Edinburgh, which has added to her many honors by conferring the degree of Doctor of Laws upon her. Her first annual report was very valuable and interesting, and each succeeding report has been more valuable than its predecessor, because continuous observation and research develops new facts and experiences, and discovers new methods of treatment and prevention.

CULTIVATION OF THE POPPY.—The return of poppy culture, whether for opium or for oil, is within a few months. Opium, rich in morphia, is grown with success in Germany and the Northern United States. The Smyrna variety is most desirable, and yields from 40s. to 75s. per pound. The seed, about 9lbs. per acre, is sown broadcast mixed with sand, and could be made to produce two crops per year. The collection of the opium, which consists merely of the indurating sap of the seed vessels, is commenced a few days after the lapse of the petals. Superficial, horizontal, or diagonal incisions are made into the capsules, as they successively advance to maturity. The operation is best performed in the afternoons and evenings, and requires no laborious toil. The milky sap thus directed outward is scraped off next morning into a shallow cup, and allowed to dry on a place away from sunlight. One to six successive incisions will exhaust the sap, according to season. The small department of Somme (France) produces opium to the value of £170,000. The importance of this industry is shown that not less than eleven alkaloids have been revealed in opium, namely—Codein, metamorphinē, morphia, narcein, narcotin, opianin, papaverin, parphyraxin, pseudo-morphin, and Thebain. The seeds yield about 40 per cent. of oil, and the oil cake is useful for fattening cattle.

EFFECTS OF SEA WATER ON SOILS. — Many years ago an exceessively high tide covered 30,000 acres of arable land in Essex, England. The soil suffered from five to twenty years afterwards. The injury was attributed, not so much to the salt left behind, as to the entire destruction of the earthworms. The soil apparently became gelatinous in character owing to the action of the chlorides on the silicates, the silicate of alumina remaining, whilst the other silicates were greatly reduced in percentage. The proper course would probably be to plough in green crops, dress with potash and farmyard manures. First crops of cereals raised after the disaster were very poor, but became better and better as the earthworms increased in number.

WEIGHT OF CATTLE BY MEASUREMENT.—Measure the girth just behind the shoulder, and the length from the fore part of the shoulder blade along the back to the bone at the tail, which is in a vertical line with the buttock, both in feet. Multiply the square of the girth, expressed in feet, by five times the length, and divide the product by 21; the quotient is the weight, nearly, of the four quarters in imperial stones of 14lbs. avoirdupois. For example, if the girth be 6ft., and the length 5¼ft., we shall have 6 × 6 = 36, and 5¼ × 5 = 26¼; then 36 × 26¼ = 945, and this divided by 21 gives 45 stones exactly. It is to be observed, however, that in very fat cattle the four quarters will be about one-twentieth more, while in those in a very lean state they will be one-twentieth less than the weight obtained by the rule.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— May 1, 1900.

Very favorable weather during April not only allowed agriculturists to push ahead seeding operations more satisfactorily than usual, but also brought along growing feed, so that a good winter supply is now assured The absence of frosts, especially in the Hills country, is a welcome change to settlers there after their experiences of several dry winters in succession. On the whole, prospects in farming and grazing interests look promising, but it must be remembered that in some portion or other of this extensive province local droughts invariably occur even in best of seasons, and this year so far proves no exception, odd districts in the dry zone not having benefited by the genial rains, so that in a few places the outlook is no better than it was at this time last year. The rains that have fallen throughout have come so gently that but few watercourses have even commenced to run, the soil thereby benefiting to the fullest extent.

Business houses are moderately brisk, fair winter trade doing in spite of the low price of wheat, which of course prevents any marked activity in farming districts. Steady development in many of the mines, especially copper, is being shown by increased exports of the red metal

An uneventful month again in the grain trade, no marked improvements of any note having occurred. The London market for wheat is as last quoted, although a scarcity of freights prevents the ready transport of grain from some growing countries, notably California, where great difficulty exists in procuring vessels this season. As the world's stocks of wheat are ample for all requirements until next harvest, and values only likely therefore to be influenced by weather prospects in the Northern Hemisphere during the next few months, the absence of any change in quotations leads us to infer that the season there is going along favorably. The glut of breadstuffs in South Africa, it is said, continues, but as an early resumption of orders may be expected (in fact, a couple of vessels are now being placed on the berth at this port), that portion of the African continent may be reckoned to absorb considerable quantities at least during the remainder of the year. Coming nearer home, Sydney and Melbourne are reported very dull, in the former especially the breadstuffs trade being demoralised, partly owing to the dislocation of commerce caused by the plague troubles, whilst the absence of orders for wheat and flour for export in Melbourne is causing weakness in price there. In millers' offal active local business has been doing, so that when a week ago a demand for bran set in from Western Australia values jumped up here, though with the plentifulness of growing feed it is not expected high rates will continue long. Fair trade has been passing in forage, but the market is only sustained through firmness intercolonially, there being no export from our colony at present.

An ordinary month's turnover has been done in potatoes, most of the supply coming forward from south-eastern districts, other sources being about exhausted. There is a strong growing demand for importeds setting in, owing to the deterioration of quality in a large proportion of the Mount Gambier grown tubers of this season, the result, it is said, of the raising of inferior though more prolific varieties in that district It is to be hoped that farmers will study quality in planting if they desire to retain this market, which they have held for so many years. Onions are plentiful, Mount Gambier controlling the market by its heavy stocks, although a good many are finding their way into the city from the Hills districts, the late crop this season sampling very satisfactory.

The volume of business in dairy products maintained, although there was a clearing out of stocks of butter by holders and speculators towards the end of the month, as they saw local supplies steadily increasing under the benign influence of the weather. Heavy importations of butter and cream from Victoria made up the shortage in home supplies. A steady run down, however, in values during the past couple of weeks gives a sure indication of this colony soon again reaching the self-supplying stage, although small but decreasing quantities are still being imported. Brisk trade has been done in eggs, with advancing prices, at one sale an almost record rise of 4d. per dozen having occurred, since which rates have ruled at a high level, but strong export demand keeps the market quite bare. The improvement in the price of bacon continued, and for this time of year the consumption is unusually heavy, chiefly owing to the relative dearness of butchers' meat. Hams scarce and saleable. As a result of the scarcity of cheese prices in this line also sharply advanced, and the lowness of stocks renders it probable that some importations will have to be made to carry on to the new season, but the easing down in value of butter will cause some of the factories to immediately revert to cheese-making, so that the present scarcity is not likely to last long. Movements in honey have been only of ordinary character. Beeswax still scarce. Almonds meeting fair demand. Heavier supplies of poultry came forward, and average condition showing better, a marked improvement was attained, turkeys especially recovering from the previously low ruling rates. The season for carcass meat has now fairly set in, and at each Friday's sale there are full catalogues of pork and veal.

Market Quotations of the Day.

Wheat.—New, at Port Adelaide, 2s. 8d. to 2s. 8½d.; outports, 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 7s. 6d. to £6 10s.; country, £5 15s. to £6 per ton of 2,000lbs.

Bran.—11d. to 11¼d.; pollard, 1s. per bushel of 20lbs.

Oats.—Local Algerian, to 2s. 6d.; good stout white, 2s. 8d. to 2s. 10d. per bushel of 40lbs.

Barley.—Malting, 3s. 2d. to 3s. 8d.; Cape, 2s. 3d. per bushel of 50lbs.

Chaff.—£3 10s. to £3 15s. per ton of 2,240lbs., dumped, bags in, f.o.b. Port Adelaide.

Potatoes.—Prime southerns, £3 10s.; Gambiers, £2 14s. to £2 16s. per 2,240lbs.

Onions.—£3 to £3 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. ½d. to 1s. 2d.; dairy and collectors', 10d. to 11d. per pound.

Cheese.—S.A. factory, choice, 8d. to 9d.; ordinary to fair, 7d. to 8d. per pound.

Bacon.—Factory-cured sides, 6¾d. to 7½d.; nice farm lots, 6¼d. to 6¾d. per pound.

Hams.—S.A. factory, 8d. to 9d. per pound.

Eggs—Loose, 1s 4½d.; in casks, f.o.b., 1s. 6d. per dozen.

Lard.—In bladders, 5d.; tins, 4d. per pound

Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 3½d. to 4d.; kernels, 8½d. per pound.

Gum.—Best clear wattle, 1½d. per pound.

Dressed poultry.—Fowls, 4½d. to 5½d.; turkeys, 6d. to 7d

Live poultry.—Good roosters, 1s. 4d. to 1s. 8d. each; extra prime heavy weights, 2s. 3d. to 2s. 9d.; fair hens and light roosters, 11d. to 1s. 2d.; small and poor, 9d. to 11d.; ducks, 1s. 8d. to 2s. 1d.; geese, 2s. 9d. to 3s. 6d.; pigeons, 3½d to 5d.; turkeys, 4½d. to 6d. per pound live weight for fair to good table birds.

Carcass meat.—Nice bright shop porkers, 4¼d. to 5d. per pound; baconers, 3¾d. to 4¼d.; heavy weights, 2½d. to 3d.; vealers 2d to 3¼d. per pound.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

How Best to Do Away with the Sweating System.

A paper of the above title, which we reach through the medium of the New Zealand *Journal of the Department of Labor*, was read by Miss Beatrice Potter, at the Co-operative Congress (England), and we condense its contents as follows:—

Before we can hope to solve the problem which forms the subject matter of this paper, says the essayist, we must answer two preliminary questions. First, we must decide what we mean by sweating and the sweating system; and, secondly, we must determine what are the causes of these evils. The first question has already been answered by an august authority. An accurate definition of sweating, at once comprehensive and concise, was arrived at by a Committee of the House of Lords when making an inquiry into the sweating system. Lord Derby and his colleagues finally decided that sweating was no particular method of remuneration, no peculiar form of industrial organisation, but certain conditions of employment, viz., unusually low rates of wages, excessive hours of labor, and insanitary workplaces When we get any one of the conditions in an extreme and exaggerated form—for instance, when we find a woman sewing neckties in her own home, straining every nerve to earn only ½d. an hour; still more when we see all these conditions combined, as in the cellar dwellings in which the Jewish boot-finishers work sixteen or seventeen hours a day for a wage of 12s. per week—then we say that the labor is sweated, and that the unfortunates are working under the sweating system.

Let us, therefore, pass on to the second point: What are the causes that produce these evils? Some persons maintain that sweating is restricted to industries in which sub-contract prevails: that, in fact, it is the middleman who is the sweater; that this man grinds the face of the poor, and takes from them the fruits of their labor. Before I studied the facts of East London industries for myself I really believed that this horrible creature existed; but I soon found out that he was purely a myth, or that the times had been too hard for him, and that he had been squeezed out of existence by some bigger monster: for I discovered that in the coat trade and in the low-class boot trade—which are exclusively in the hands of the Jews—where the work is still taken out by small contractors, these middlemen, far from being bloated idlers, work as hard, if not harder, than their sweated hands, and frequently earn less than the machinist or presser to whom they pay wages. On the other hand, trades in which English women are employed—such as the manufacture of shirts. ties, umbrellas, juvenile suits, etc.—the middleman is fast disappearing. It is true that formerly the much-abused sub-contract system prevailed in these trades; that is to say, some man or woman would contract with the wholesale manufacturers to make and deliver so many dozen garments for a certain sum. He would then distribute these garments one by one in the homes of the women, or, perhaps, he would engage them to work in his own house. He might receive 1s. for the making of each garment, but he would give only 10d. to the actual workers, pocketing 2d. in return for his trouble and risk. Of late years the more enterprising wholesale manufacturers have thought it most unjust that the middleman should pocket the 2d., and so have opened shops all over the East End of London, where they distribute the work just as the middleman used to do. But, strangely enough, they still pay 10d. to their workers, the only difference being that instead of the middleman getting the balance they pocket the 2d. themselves. Nor do they trouble themselves in the very least where these garments are made. The women who support themselves, and perhaps their families, by this class of work live in cellars or garrets, sometimes two or three families in one room. This does not concern the wholesale manufacturer. No doubt he would tell you that the middleman was the sweater, and that he had destroyed him. But unfortunately he did not destroy, nor even diminish, what the practical observer means by sweating. The actual worker gains absolutely nothing by the disappearance of the sub-contractor, middleman, or so-called sweater. In East London the change has been, so far as the workers are concerned, from out of the fryingpan into the fire.

And if we leave the clothing trade and pass to the lower grades of the furniture trades, the manufacture of cheap boots in London, of common cutlery at Sheffield, of indifferent nails at Halesowen, we meet with the same sorrowful figure—the small master or outworker buying his material on credit and selling his product to meet the necessities of the hour, in all instances underselling his competitors, great and small. Respectable employers interested in a high standard of production, trade unionists keen for a high standard of wage, agree in attributing to this pitiful personage the worst evils of the sweating system.

I do not wish you to imagine that I deny the existence of the sweater in the sweated industries; but I deny that the sweater is necessarily, or even usually, the sub-contractor or employing middleman. The sweater is, in fact, the whole nation. In the front rank of the most numerous class of sweaters we find the oppressed workers themselves. The middleman, where he exists, is not the oppressor, but merely one of the instruments of oppression. If we must describe him as a noxious insect we should picture him as the maggot that appears after decay has set in. He is not the cause, but one of the occasional results of the evil. He takes advantage of the disorganised state of the substance which surrounds him, and lives on it; if he does not do so, some other creature will devour both him and his food. What we have to discover, therefore, is the origin of the disorganisation itself.

In all the manufacturing industries in which sweating extensively prevails we discover one common feature—the great mass of the production is carried on, not in large factories, but either by small masters in hidden workshops or by workers in their own dwellings. As a natural consequence of this significant fact the employer is relieved from all responsibility for the conditions under which the work is done. The workers, on the other hand, incapacitated for combination by the isolation of their lives, excluded by special clauses from the protection of the Factory Acts, are delivered over body and soul to the spirit of unrestrained competition arising from the ever-increasing demand for cheap articles in the great markets of the world.

In the sweated industries, by the system of homework, the virtual employer altogether escapes the responsibilities of his position. He gives out his work from an office to a miscellaneous and scattered set of workpeople, whose places of abode he scarcely even knows; his work is done in uninspected domestic workshops, it may be under the most insanitary conditions; his employés must, as he knows, toil far into the night to comply with his demands, but he incurs no penalty—in short, it is homework which creates all the difficulties of our problem, for it is homework which, with its isolation, renders trade combination impracticable, which enables the manufacturer to use as a potent instrument, for the degradation of all, the necessity of the widow or the greed of the Jew; and, more important still, it is homework which, by withdrawing the workers from the beneficent protection of the Factory Acts, destroys all legal responsibility on the part of the employer and the landlord for the conditions of employment.

It is useless to shut our eyes to the fact that co-operators can never hope to become the employers of the great mass of the workers who suffer under the sweating system. Taken as a whole, the sweated industries may be said to work mainly for export. The low-class clothing made in East London is largely worn, not by our own people, *but by the inhabitants of Australia and the Cape.* The common boots and shoes turned out wholesale by the Jewish families of Whitechapel or the Leicestershire villagers equally supply the colonial market. The sweated knives of Sheffield disgrace her name and prestige throughout the whole world; and even in those cases where the cheap and nasty products of the sweating system are used at home they supply the needs neither of the co-operators nor of those among whom co-operation is ever likely to flourish. It is the woman earning ½d. an hour at clothes for the Cape who buys the cheap furniture hawked about the Curtain Road. It is the Jewish boot-finisher working for abroad who, in his turn, buys the slop clothing displayed in the sweater's front shop. We are thus in a vicious circle, where sweating itself creates the conditions for the sweating system.

To find an effective remedy for the evils we have been describing we need only observe the teachings of history. The Adulteration Act and the Merchandise Marks Act were cures for past evils in the certain departments which they now protect. And if we consider sweating as involving the degradation of millions of our fellow-workers, we may again learn from history the most practical way of rendering the worst forms of sweating impossible. Seventy years ago the Rosedale weaver was suffering from all the evils which we now call "sweating." Legislation, and legislation alone, was competent to cope with these gigantic evils. Similar evils elsewhere now demand similar remedies. The only radical cure of the sweating system is the application of legislative regulation to the special circumstances of the sweated industries

I venture to maintain that it is perfectly feasible to insist on the responsibility of the landlord and employer in the sweated industries, and thus to bring the workers under the protection of the Factory Acts. The problem confronting us is the substitution of the factory system, with its regulated hours and enforced sanitation, for manufacturing carried on in dwellings and unregistered workshops. We cannot at one blow prohibit homework, but we must, at any rate, remove the exceptional legal privileges which at present offer a direct encouragement to the wholesale traders who give out work to the detriment of the responsible manufacturer. Our task, in short, is to build up in these disorganised industries the legal responsibility of the employer and landlord.

The legislation which I have elsewhere proposed may broadly be said to provide for a double registration of landlord and employer of all places in which manufacturing work is carried on. The landlord, should he permit the use of his premises for manufacturing purposes, will be compelled to provide all accommodation necessary to the health of the workers. And the duty of preventing overcrowding or any other improper use of his premises will be as rigidly enforced on the owner of the nailmaker's hovel or the boot-finisher's cellar as it already is on the millowner and the colliery proprietor. On the other hand, the employer who, to escape the Factory Acts, gives work out to be done at home, will be made equally responsible with the millowner for the age, health, education, and the hours of labor of those members of the protected classes whom he employs. This double responsibility of the landlord and the employer would be, I believe, a direct and fatal blow to the sweating system.

And while the conditions of the worker would be improved, there is no reason to suppose that the cost of commodities would be increased. Already the superior quality of factory labor, with its use of machinery, renders it more than doubtful whether there is any real economy, even to the employer, in homework. If we regard the quality as well as the price of the article, there is an almost unanimous testimony that systematic homework tends to fraudulent production.

The task, therefore, which I propose to do away with the sweating system is to follow the precedents with regard to the Adulteration Acts and the Merchandise Marks Acts, and to insist upon Parliament passing such a new Factory Act as I have been describing.

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NOTES AND COMMENTS.

Up to the 17th of May cold dry weather was experienced over the agricultural areas, excepting the West Coast districts, where splendid soaking rains fell early in the month. About the middle of the month the colony, with the exception of a limited area, was blessed with good rain, and since then it has been showery. The feed and crops, which had received a decided check, have recovered, and are now making good progress, and the prospects generally remain very favorable. This does not, however, apply to the country east of the railway north of Petersburg and up to Hawker. This portion has been singularly unfortunate in missing the April rains altogether, and in some parts the total fall for five months is under 2in. Unless good soaking rains fall soon the crops in this area will be very poor, while feed is already quite scarce.

Owing to the widespread existence of phylloxera in Victoria, and to the fact that all efforts to stamp out the pest are being abandoned, it has been decided, in order to protect our vine-growing interests, that no plants, other than ordinary pot-grown plants, shall be admitted into South Australia with soil on them. Outdoor plants, such as roses, carnations, &c., will require to have the roots washed clean of soil by the consignor, and will be fumigated on arrival here. Where this is not done the plants will be destroyed by the officers of the Department of Agriculture. These precautions are rendered absolutely necessary, as the re-establishment of phylloxera infested vineyards on American stocks means that a harbor will be afforded to the insect for all time, and it is merely a matter of time for almost every vineyard to become infested. The interests of our growers demand that we should do everything possible to prevent the pest obtaining an introduction into this colony.

The demand during the past month for Mr. Geo. Quinn's pamphlet on the "Pruning of Fruit Trees" evidences that the work meets a decided want, especially amongst small orchardists. As only a limited number of copies are available, those of our readers desiring to obtain a copy should make early application to the General Secretary, Agricultural Bureau. The cost of the pamphlet is 1s. per copy, postage 2d. extra.

The enormous growth of the demand for mineral phosphates is evidenced by the following trade summary of the output of crude phosphates in the United States for 1899:—Of Florida phosphate, 858,978 tons; South Carolina phosphate, 419,763 tons; Tennessee phosphate, 500,000 tons; North Carolina phosphate, 13,000 tons; total, 1,791,738 tons. When treated, this would make at least 3,000,000 tons of the commercial mineral super. Although the United States is the principal producer of mineral phosphates, Canada, Belgium, Algeria, and other countries also produce very considerable quantities.

In Nova Scotia the Department of Agriculture devotes the sum of £2,500 per annum in assisting farmers to improve their flocks and herds by the introduction of pure-bred stock. The money is allotted to the various agricultural societies, which in their functions approach more nearly our Agricultural Bureaus than our annual show societies, of which we have too many. In 1899 there were existent in Nova Scotia 119 societies with 6,974 members, subscribing in all about £2,000 to supplement the Government grant for the improvement of live stock. The majority of the societies own or control pure-bred stock, mostly sires, but in some instances both sexes, for breeding pure-bred stock for sale. In all over 200 cattle, 150 sheep, and 100 pigs are controlled by the societies for the purpose of improving the live stock of the respective districts. What are the beneficial results accruing from the operations of our South Australian societies (leaving out the Royal Society), which receive in all £1,500 per annum from the department, as compared with the influence of the operations of the societies of Nova Scotia?

The Farmers' and Settlers' Co-operative Association of New South Wales intends next season to test the advantages alleged to attach to the use of 2bush. bags for wheat, and has ordered a supply. The cost per dozen at present is 2s. 6d., whilst 4bush. sacks cost 5s. 4d. The saving is 4d. on each 48bush. of wheat. The weight of the small bag is 12oz., whilst the sack weighs within a fraction of 48oz. The farmer stands to gain by this change whilst wheat is below 3s. per bushel, and those who have to handle the lighter bags will probably do as much work during eight hours, with less labor, than they could do in the same time with the 4bush. sacks.

So many wild assertions have been made concerning the efficacy of pickling seed wheat with bluestone solution for the prevention of bunt—or "stinking smut"—that it is desirable that each Branch of the Agricultural Bureau should try the following experiment:—Make a pickle with 1oz. bluestone in 2qts. water, break a number of bunt balls and shake in a pickle bottle along with a handful of good sound wheat. Count out 400 grains and put into the pickle. Remove the whole at the end of five minutes. Sow 100 seeds same day, and 100 five days later, 100 ten days later, and the last 100 fifteen days later. At each sowing put in also 100 seeds from the original bulk that have never been pickled or infected artificially with bunt. If the experiment is conducted fairly there will remain little doubt with regard to the effect of pickling seed wheat with bluestone.

Our producers want to gain a permanent footing in the British market. There is no room there for second-class produce. Our prospective customer is willing to pay high prices for anything that is the best of its kind, but if any attempt is made to foist inferior stuff upon him he will not only refuse to take it, but will view with suspicion all produce from the same quarter for a long time after. First grade stuff, sorted and packed in the most attractive way that is possible, will always command his attention so long as it maintains that character, but when it alters or falls away in quality or get-up he wants no more of it, and it will take years to regain his confidence.

Some time during July or early in August an effort should be made to deluge the land on which vines or fruit trees are growing. In many places this may be accomplished by diverting water from roadsides, gullies, or hill slopes. The land should be opened up by deep ploughed channels, with as low a gradient as is possible, so that the water can be retained by stops at intervals and allowed to soak in.

During July or early in August, where peach aphis is prevalent remove the soil for a foot around the stems of the trees, so as to lay bare the roots, and pour in a gallon of decoction made with 3ozs. of tobacco waste and 3ozs. of soft soap per gallon; then thoroughly spray the branches with a similar decoction, to kill any insects that may have crawled there from the roots.

Arsenite of lime is cheaper and more reliable than paris green as a spray for insects which gnaw leaves or fruit. The first spraying for codlin moth caterpillars should be made before the calyx, or "eye," closes, and this will result in the death of more codlin moth caterpillars than from several later applications. As the calyx of the pear does not close up, the spraying may be delayed a little longer than for apples.

Apple and pear scabs, shothole, and curl-leaf fungi will probably be strongly in evidence next season where fruitgrowers neglect to thoroughly spray their trees with Bordeaux mixture *before* the buds open. The best time probably to spray is when the buds begin to swell in early spring.

Californian Fruitgrower says that "as a customer, Great Britain is just 6,000 times more valuable to us than the whole of Africa."

A letter from Mr. F. M. Webster, M.Sc., entomologist at the Ohio State Agricultural Station, Wooster, Ohio, U.S.A., dated March 28th, 1900, to the General Secretary of the South Australian Agricultural Bureau (Mr. A Molineux, F.L.S.) confirms a statement made by the latter person on page 633 of the *Journal of Agriculture*, published February, 1900, that the bloom would be killed as well as the bees visiting the blossoms of apple trees when sprayed with Paris green (or other arsenical substances). Mr. Webster has proved this abundantly by practice, and concludes that "it is very dangerous indeed to spray apple trees while in bloom."

In 1854 there were no eucalypts in Algeria; now there are many millions. Thirty-five years ago the place was a dry desert; now there are fertile spots and an even fall of rain. At the the time of the Roman conquest Algeria was a fertile country, abounding in forests and springs; but the place was afterwards overrun by Arabs, who destroyed the trees, and the springs dried up, the grass disappeared, rains ceased to fall regularly, but violent storms occurred frequently, extremes of cold and heat were experienced. Then Napoleon III. ordered trees to be planted by hundreds of thousands. The chief gardener of Paris reported that Australian eucalypts grow very rapidly and produce valuable wood, and since then numerous private persons and companies, in addition to the Government, have planted millions of trees, with great advantage to the climatic conditions as well as to the finances.

Landholders should plant useful trees in place of Moreton Bay figs, Remarkable Pines, blue gums, (or red gums where the soil is calcarerous and dry), and others. There are many trees which grow rapidly on suitable soil in congenial climate, such as is found either upon our plains or amongst the hills and in the South-East, and at the same time produce really valuable timber. Sugar gums, Yate, and Tooart gums are all right, and red gum does well in damp soils where lime is not abundant. Camphor trees, walnuts, planes, basswoods, poplars, elms, oaks, kauri pines, catalpas, maples, ebonys, beeches, and a dozen other varieties of trees ought to be extensively planted, and would immensely increase the value of the land whereon they were grown.

Where pigs have no access to mud in which they can wallow, they are liable to become infested with lice, which cause much discomfort and retards the growth of the animal. The owner will do well to use a spray pump, similar to that used for spraying fruit trees, and apply kerosene emulsion of similar strength to that used for destruction of plant lice.

New South Wales has been rejoicing over the fact that exported eggs have reached London in good order and have realised fair prices. At the same time 25,000dozs. of eggs have, within a few weeks, been introduced into New South Wales from China. The Chinese eggs must have been of poor quality, because they realised only 9d. to 1s. 3d per dozen, whilst the local eggs sold at 1s. 3d. to 1s. 6d. per dozen. The thing most worthy of notice is that eggs from China should have sold so well. Surely the farmers of New South Wales are neglectful of their own interests when poultry-keepers in China can compete against the local article and obtain such good prices.

MANGOLDS V. SUGAR BEETS FOR MILK PRODUCTION.

Chemical analyses show that sugar beets contain a lower percentage of water and a higher percentage of nutritive material than mangolds The main difference in nutritive material, however, is in connection with the fat and heat producing substances, sugar beets containing more of such substances than mangolds. In order to test the comparative value of these two kinds of roots for milk production, two experiments, each with different cows, have been completed, and the results of the two experiments correspond so closely that they are of interest.

In each experiment four cows were used. They were selected from the herd in the dairy department, care being taken to select cows as nearly as possible in the same stage of lactation. After a week's preparatory feeding, during which all the cows were fed the same ration, the rations were changed. Two of the cows were fed 60lbs. of sugar beets per cow per day for two weeks; then they were fed 60lbs. of mangolds per cow per day for two weeks. The other two cows were fed 60lbs. of mangolds per cow per day during the first two weeks, and then changed to 60lbs. of sugar beets per cow per day during the next two weeks. Thus each experiment lasted four weeks, and each cow was fed two weeks on mangolds and two weeks on sugar beets. In addition to the roots the cows received a meal ration and what clover hay they would eat, each cow receiving like quantities of hay and meal. In the first experiment the meal ration consisted of equal parts by weight of peas, barley, and oats, and each cow was fed 7lbs. of this mixture per day. During the second experiment each cow was fed 6lbs. of bran and 2lbs. of pea meal per day.

It might have been a better test of the relative nutritive value of these two foods had no meal been fed; but the object of these experiments was to test the influence of these foods upon the milk flow when fed as they most likely would be in ordinary practice—namely, in conjunction with a meal ration. This seems to be the main practical point at issue, and the question in which practical men are most interested

The following condensed table shows the amount of milk produced by each cow on sugar beets and on mangolds in each experiment:—

	Milk produced on Sugar Beets.	Milk produced on Mangolds.
First Experiment.	lbs.	lbs.
Cow No. 1	306·75	277·50
" 2	393·75	406·75
" 3	262·00	272·50
" 4	305·50	318·75
Total	1,268·00	1,275·50
Second Experiment.		
Cow No. 1	319·00	330·00
" 2	318·75	326·50
" 3	273·25	265·25
" 4	319·25	316·75
Total	1,230·25	1,238·50

COMMENTS.

1. In each experiment there is a slight difference in the total milk yield in favor of the mangolds, amounting to 7·50lbs. in one case and 8·25lbs. in the other, in the milk produced by four cows in two weeks.

2. In each experiment cows 1 and 2 started on sugar beets and finished on mangolds, while cows 3 and 4 started on mangolds and finished on sugar beets. With this in mind, a study of the table shows that in the first trial cow No. 1 decreased in milk flow, and cow No. 2 increased in milk flow, after being changed from sugar beets to mangolds; and that both cows 3 and 4 decreased in milk flow after being changed from mangolds to sugar beets. In the second trial, however, all the cows gave more milk during the second two weeks than during the first two, but the cows which were changed from sugar beets to mangolds made a greater increase, on the whole, than those which were changed from mangolds to sugar beets.

3. Everything considered, these experiments indicate that there is very little, if any, difference between mangolds and sugar beets as foods for stimulating the flow of milk. It must be remembered, however, that these trials have no bearing upon the relative values of these foods for maintaining life or producing fat.

4. On the college farm mangolds have given much larger yields per acre than sugar beets.—From *Bulletin Ontario Agricultural College.*

HOW MUCH SEED TO SOW.

The following hints may be useful to amateur cultivators, but in many cases the quantity of seed that should be sown must be controlled by the earliness or lateness of the time of sowing, the conditions of soil and climate, and other circumstances :—Asparagus—1oz. to 60ft. of drill. Barley—1½bush. broadcast per acre. Beans—broad, 1½bush. per acre, in drills; dwarf, 1qrt. to 100ft. of drill; runner, 1qrt. to 150ft hills. Beet—5lb. per acre in drills, 2ozs. to 100ft. in drill. Buckwheat—1bush. per acre broadcast. Cabbage—In nursery beds, for 1 acre, 4ozs. Carrot—1oz. to 150ft. in drills, 3lbs. per acre. Clover and lucern—9lbs. to 15lbs. per acre. Corn (maize)—1qrt. to 200 hills. Cucumber—1oz. to 50 hills. Chicory and endive—1oz. to 150ft. of drill. Flax—1½bush. per acre. Hemp—1bush. per acre, drilled and thinned. Grass—Cocksfoot, English Rye, Yorkshire Fog, 1½bush. per acre; prairie grass, 2bush. per acre; rib and timothy, 20lb. per acre; mixed lawn grass, 4bush. per acre. Kohl rabi—2½lbs. per acre, drilled; 10ozs. on 18ft. square for transplanting. Lettuce—1oz. for 3,000ft. in length, 1ft. apart. Leek—1oz. for 100ft. of drill. Lucern—10lbs. drilled, 20lbs. broadcast, per acre. Melon—Water, 1oz. to 30 hills; sweet, 1oz. to 60 hills; marrow, 1oz. to 16 hills. Mangolds—5lb. per acre. Millet—1bush. per acre broadcast, 16lbs. in drills. Mustard—1½bush. broadcast. Oats—2bush. per acre broadcast. Onion—1oz. to 100ft. of drill; 5lb. per acre broadcast; for setts in drills, 20lbs. per acre. Osiers—Cuttings, 23,000 per acre, 15in. x 18in. apart. Parsnips—6lbs. to 8lbs., drilled, per acre. Peas—2½bush. drilled, 3½bush. broadcast, per acre. Potatoes—12cwt. to 15cwt. of cut setts per acre. Rape—3lbs. to 5lbs. per acre, drilled, 15in. apart. Sainfoin—50lbs. clean, or 4bush. in pod, per acre. Swedes and turnips—3lbs. per acre broadcast, 1½lbs. drilled. Vetches or tares – 3½bush. broadcast per acre.

A STRONG solution of bluestone (sulphate of copper) will kill grass and other weeds on garden paths.

PURCHASE OF COMMERCIAL FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

With the extensive use of commercial fertilers for cereal crops, fruit trees, and vegetables, the purchaser requires to exercise a considerable amount of care if he is to get the largest amount of the required plant foods for his money. Too often fertilisers are purchased on the strength of their name, or the vendors' statements, without any inquiry as to constituents or comparison with others of a similar character. I propose, therefore, to show in this article how absolutely necessary it is for purchasers to make themselves acquainted with the values, not only of the fertilisers they are thinking of buying, but of others in the market which may or may not be more suitable and cheaper in the end.

As the first example, I will refer to bonedust. There are at least ten different brands of this fertiliser sold in Adelaide, and the guaranteed analyses vary from 2·6 per cent. nitrogen and 35 per cent. tricalcic phosphate to 3·6 per cent. nitrogen and 52 per cent. tricalcic phosphate; some samples contain more nitrogen and less phosphate, but this latter may be considered about the highest grade on the market. Now there is only a difference of 15s. per ton in the price asked for these two extremes. Let us examine into and ascertain what is the difference in value as compared with price, not taking into account the fineness of grinding, which would, in this instance, add to the value of the high-grade bonedust. Comparing the guaranteed analyses and prices of the various bonedusts on the market, a fair unit value to attach to nitrogen is 13s., and to tricalcic phosphate 1s. 4d. per ton. At these figures we have the following result:—

Low-grade Bonedust—(2·6 per cent. nitrogen, 35 per cent. tricalcic phosphate).

		£	s.	d.
Value per ton	2·6 per cent. × 13s. =	£1	13	10
	35 per cent. × 1s. 4d. =	2	6	8
	Total	£4	0	6

High-grade Bonedust—(Nitrogen, 3·6 per cent., tricalcic phosphate, 52 per cent)

		£	s.	d.
Value per ton	3·6 per cent. × 13s. =	£2	6	10
	52 per cent. × 1s. 4d. =	3	5	0
	Total	£5	11	10

Difference in value, £1 11s. 4d.
Difference in price, 15s.
Balance in favor of high-grade manure, 16s. 4d. per ton.

As before stated the higher grade is also much finer ground, which adds to its value.

Then, apart from the sole aspect of value, another point often lost sight of by buyers is the question of extra carriage on the lower grade materials. Taking these two bonedusts as an example, it will be seen that 20cwts. of the high grade contains as much plant food as 27cwts. of the low grade, so that in addition to paying a much higher price relatively for the latter, there is also a largely increased cost—in freight, or labor, or both—for handling the low grade. This is a very serious item, and in many cases would add several shillings per ton to the difference against the low grade material.

Then, taking another instance, that of the so-called complete fertilisers, *i.e.*, fertilisers that contain nitrogen, phosphoric acid, and potash in varying quantities. Apart from any question as to whether it is more profitable to purchase the ingredients separately and mix them or to purchase them already mixed, it must be remembered that as soils vary very largely it is almost impossible for the manufacturer to supply a complete fertiliser which is suitable to a variety of purchasers and economical to use.

Most of the complete fertilisers imported are, compared with price at which their constituents can be purchased separately, too costly. As an example of this we will take a fertiliser for which £10 per ton is asked. This fertiliser contains approximately 4·5 per cent. nitrogen. 2·8 per cent. potash, 20 per cent. water soluble phosphate, and 5 per cent. insoluble phosphate. It is a splendid fertiliser, and no doubt for use in small quantities may pay to use even at the price mentioned, but to use by the hundredweight or ton at price quoted is quite a different matter. A ton of this fertiliser contains:—

Approximately 101 lbs. nitrogen
62 lbs. potash
448 lbs. water soluble phosphate
112 lbs. acid soluble phosphate.

Nearly the same quantities of these plant foods can be obtained in the following mixture:—

	£.	s.	d.
6cwts. nitrate soda, containing 107lbs. nitrogen, cost	3	3	0
1cwt. sulphate potash, containing 58lbs. potash, cost	0	18	0
12cwts. mineral super, containing 484lbs. water soluble phosphate, 40lbs. acid soluble phosphate, cost	2	17	0
Total	£6	18	0

A ton, therefore, of the above mixture will contain more nitrogen and water soluble phosphate, and a little less potash and acid soluble phosphate than the complete fertiliser referred to, but the variations may be fairly taken to balance one another, the difference being somewhat in favor of the mixture. It will be seen that there is a saving in cost by purchasing the ingredients separately and mixing them of £3 2s. per ton. The cost of mixing very thoroughly would not amount to more than 3s 6d. to 5s. per ton. If muriate of potash is substituted for sulphate, 100lbs., costing 12s.. would suffice, and would make the difference in cost £3 8s. per ton. Using sulphate of ammonia instead of nitrate of soda would make no difference in cost.

The same amount of plant food could be obtained by using other mixtures, always, where discretion is exercised, in a saving over the cost of the complete manure referred to, but it is unnecessary to give these in detail. For orchard work it would probably be better to use some bonedust and less super, giving a higher percentage of acid soluble phosphate and a lesser percentage of water soluble, besides supplying some nitrogen. Then again, the ingredients of another complete fertiliser sold at £7 10s. per ton could be purchased separately for £6 5s., while yet another, for which £8 10s. per ton is asked, is really worth £7 7s., plus cost of mixing. It is, of course, not intended to give purchasers the impression that all complete manures are unprofitable to purchase. Some of the local manufacture show much more favorably than the previous illustration. Take, for example, a complete manure of local manufacture with the following guarantee:—

Nitrogen	1·2	per cent.
Potash.......................................	0·3	per cent.
Water soluble phosphate	17·0	per cent.
Citrate soluble phosphate	12·75	per cent.
Acid soluble phosphate	3·0	per cent.

This is too low in nitrogen and potash to be properly regarded as a complete manure; the price asked is £4 15s. per ton, while it would cost at least £4 7s. 6d. per ton to purchase the necessary fertilisers to prepare a similar mixture; 7s. 6d. per ton cannot be regarded as an excessive charge for the labor of mixing and the knowledge required to select the proper materials to make the fertiliser referred to.

In dealing with this matter it must not be taken that the mixing of nitrate of soda, sulphate of potash, and superphosphate is recommended. The purpose is to show how to obtain at cheapest rate a specified percentage of the three forms of plant food. With orchards at least it would be better to apply the ingredients separately; phosphates in the winter and potash and nitrates early in spring. The nitrate might be more profitably applied to many plants in several dressings during the earlier periods of growth, instead of all at one time. Then again, nitrate of soda may on no account be mixed with super, nor may sulphate of ammonia be mixed with Thomas' phosphate, lime, or wood ashes, nor superphosphate with Thomas' phosphate or lime. If any such mixtures are made chemical changes take place, resulting in serious loss of the fertilising properties of the mixture.

COMPARATIVE VALUE OF VARIOUS FORMS OF PHOSPHATES.

A question that is frequently asked in this colony is "Which form of phosphatic manure is best to use—Superphosphate, bonedust, or Thomas phosphate?" It has been frequently asserted that the water-soluble phosphate in supers has only an immediate effect on the crop, leaving the land poorer in nitrogen and potash than before: in other words, the crop manured benefits at the expense of the soil. On the other hand, it was contended that Thomas phosphate and bonedust being slower in their action did not give such immediate results as super, but permanently benefited the land. These opinions were held by many scientific authorities a few years back, but lately careful researches have exploded this theory. There are hundreds of farmers in this colony who can testify to the beneficial effect on the grass where super has been applied to the wheat crop. Not only does the grass grow better, but stock prefer it to the grass on the unmanured land. This effect has, in some cases, been noted on the grass for two successive seasons; but, owing to the largely prevailing practice of cropping the same ground with cereals every third year, it is not possible to note how long the dressing of super would show in the growth of grass. As far as we know, there have been no experiments carried out in Australia to note the comparative after effects of the various phosphatic manures. This point has, however, not been neglected in Germany, many of the scientists of which country strongly advocated the claims of Thomas phosphate over superphosphates on account of its alleged permanent effects.

In a recent issue of the *Dunger & Leim*, Dr. Ullmann, a prominent German agricultural chemist, remarked:

> "What is the most effective form of manuring with phosphoric acid?" The above question has often been put to me, and my answer, based on practical observations and results obtained at experimental stations, has been to the effect that on good soils the quickest, most reliable, and therefore most profitable results are given by phosphoric acid, soluble in water, as a superphosphate. This opinion has often been contravened, and efforts made to prove the contrary by results obtained at other experimental stations. However, it now appears that further results prove the correctness of my statements. In the course of two lectures to practical farmers Professor Dr. Marcker made the following declaration:—"While it appears that on

light soils the use of basic slag can be recommended, there is no doubt that on better soils superphosphate gives more certain and better results. For instance, we obtained per morgen (a morgen is about two and a half acres) of beetroot:–

	I.	II.
From application of superphosphate	244·7cwts.	231cwts.
From application of basic slag	237·4cwts.	221cwts.
Deficiency of yield from basic slag	7 3cwts.	10cwts.

And of potatoes:—

	I.	II.
From application of superphosphate	148·1cwts.	91·5cwts.
From application of basic slag	134·4cwts.	71·0cwts.
Deficiency of yield from basic slag	13·7cwts.	20·5cwts.

Wheat and barley on clay soil gave similar results. We came, therefore, to the conclusion not to use basic slag again on our soils. Basic slag can be used with advantage on sandy and peaty soils, and on better soils it may be employed for leguminosa, but on clay soils there is no doubt that preference should be given to superphosphates. This conviction is not only entertained by me, but I find it confirmed wherever I have expressed it." This report is important and interesting. In support of the advocacy of basic slag it has been often said that, according to Marcker's opinion, superphosphate could be replaced by basic slag, but the results now obtained at Lauchstaedt have convinced Dr Marcker that basic slag should not be used for grain or root crops.

In 1889, Professor Wagner, one of the foremost agricultural scientists of Germany, made a number of careful experiments in respect to the fertilising value of different phosphatic fertilisers, which led him to the surprising conclusion that the value of phosphoric acid in ordinary raw bonedust was remarkably low compared with superphosphate and Thomas phosphate. At the same time the alleged superiority of the after effects of bonedust received a shock, for it was found that when the same manuring was continued for the second and third years the results from superphosphate were much ahead of raw bonedust. In addition to the phosphates, each pot in which the experiments were conducted received equal quantities lime, potash, nitrogen, &c. The results of these experiments were so surprising that at the request of an association of bonemeal manufacturers Professor Marcker, of Halle, made a thorough investigation extending over a period of four years, commencing in 1892. His experiments were made with raw and steamed bonedust of the best qualities, and embrace different classes of soils and crops. In the first year's experiments with wheat, super. gave vastly superior returns to either bonedust or a mixture of bonedust and super. Raw bonedust and steamed gave nearly equal results. With barley the results were similar. The second year oats were sown in the pots in which the wheat tests had been carried out, nitrogenous manures being applied in equal quantities, but no phosphates. The result was again in favor of the super., except where a very light dressing was applied; in this one instance the steamed bonedust gave a slightly higher return. The following year mustard was grown, only nitrogenous manures being given. Here the after effects of bonedust were in each case still less favorable as compared with superphosphate. The conclusion Professor Marcker arrived at was that the result obtained by the use of bonedust was almost entirely due to the nitrogen contained therein, but in this conclusion he is opposed to the majority of authorities. Experiments carried out at the Berne University in 1896 in meadow soil poor in phosphoric acid showed very much better results from superphosphate and Thomas phosphate than from bonedust, the crop sown being oats.

The results of these, and numerous other European experiments which show the same favorable after effects of superphosphate, do not, of course, answer the question as to which is the best of the phosphatic fertilisers to use for wheat. As a matter of fact this will depend almost entirely upon the local conditions of soil and climate, and the use to which the land has previously been put. From European results it would appear that light sandy soils give more favorable results with Thomas phosphate and bonedust than do the naturally richer soils. Here, the contrary is usually the case; on the light soils super, on the whole, is most beneficial. Differences in climate will doubtless account for this. Where our high grade native guano and Thomas phosphate do give favorable results they are more profitable to use than either bonedust or super, as they are much cheaper than either; but, up to the present, local experience shows that for wheat super is usually most profitable. Comparing the one group of acid-soluble phosphates (bonedust, guano, and Thomas phosphate) with the other of water-soluble phosphates (including both the imported super and various brands of local manufacture in which only portion of the phosphoric acid is made soluble in water), the farmers of South Australia use at present fully six tons of the latter group to every ton of the former.

CONFERENCE ON AGRICULTURAL EDUCATION.

Recognising the growing demand for the extension of agricultural education, the Minister of Education and Agriculture invited representatives of the Councils of the Agricultural College and School of Mines, the University, the Central Agricultural Bureau, and the Dairy Board, with officers of the Departments of Agriculture and Education, to confer as to whether any extension was desirable, and if so, in what direction. The representatives met in conference on May 1st, and again on May 8th, when the following scheme was adopted as a recommendation to the Minister:—

I. TEACHERS.

1. All pupil teachers and student teachers to have facilities for instruction at the Adelaide Agricultural School.
2. Provided the University admits Agriculture as one of the subjects qualifying for the B.Sc. degree, student teachers who are proceeding to that degree to have facilities for studying Agriculture at Roseworthy by being granted free railway tickets and board at the College.
3. Holiday courses to be provided for teachers at the Agricultural College and Agricultural School, and free railway tickets and board, or allowance, granted to teachers to attend the courses.

II. SCHOOLS.

1. Schools in suitable localities to be provided with facilities for teaching agriculture and horticulture.
2. (*a*) Special agricultural classes to be established at suitable centres on the lines of those at Adelaide, Clare, Jamestown, and Naracoorte.
    (*b*) At these schools popular day and evening courses to be established in agriculture and horticulture.
    (*c*) At the Adelaide School the experimental area to be extended to meet the increased demands thus made upon it.
3. All these classes to be administered by the Education Department.

III. AGRICULTURAL COLLEGE.

That a complemental farm in a district of high capacity be equipped and attached to the Agricultural College, as suggested by the council of that institution, so that proper facilities may be provided for instruction in dairying and fruit culture; that experiments may be conducted at one or the other place which may be of value to the whole range of arable land in the colony; and that students may have in their course the very great advantage of experience of the two prevailing sets of conditions of soil and climate of the colony.

Agriculture at the University.

At the suggestion of the Minister of Education, the Council of the University of Adelaide has decided to give agriculture a place among the subjects included in the B.Sc. course. The Education Committee and the Faculty of Science, after conferring with Professor Lowrie, approved of the proposal, and the Council has now asked the former body to prepare the necessary regulations.

MACCARONI-MAKING.

Some time ago there was an enquiry from a Melbourne house for maccaroni wheats, but there were no growers of flinty wheats in South Australia, and a promising business therefore lapsed. Perhaps the manufacture of vermicelli and maccaroni has lapsed also; but there is a good deal of the article used in Australasia, and it would be well if the whole of what is required were made within the colonies. The following information has been supplied by the British Consul at Naples:—"Maccaroni is made of hard red wheat from the Black Sea, mixed with Italian wheat, grown mainly in the plains around Foggia. This is ground into semolina (not flour), the bran and husks are removed, and the semolina kneaded in hot water till it has the appearance and consistency of dough. The dough is then placed in a vertical brass cylinder, about 8in. or 9in. in diameter, the bottom of which is a plate like the rose of a watering pot, which is fine or thick, according to the maccaroni required. Thus, for making vermicelli and all kinds of solid maccaroni the holes are very small, while for making tube maccaroni the holes are much larger. In the latter case also a conical blade is fixed in the middle of the hole to form a tube. The dough being placed at the top of the cylinder, it is driven down by hydraulic pressure through the perforated plate and cut off by hand in lengths of about 3ft. It is then hung on canes in the sun to dry. In the case of the solid maccaroni there is no difficulty in grasping the process. In the case of the tubular maccaroni the conical blade and its attachment cut through the dough and the maccaroni issues with a slit all along it. This, however, skrinks together at once and forms a perfect tube, the join being practically invisible. No maccaroni is now made by the laborious hand process. There was for a long time a prejudice against machinery, but this has been overcome. The best maccaroni is made at Gragnamo and Torre dell'Annunziate. A little also of the best quality is made at Amalfi, Alfonso Garofalo, of Gragnamo, being the most important manfacturers. About a million boxes are sent annually to the United States, and about 10,000 to London. The remainder is sold in Italy.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J. Perkins, Government Viticulturist.

The new season has opened under auspicious circumstances, and once again that "hope that springs eternal in the human heart" begins to blot out from memory our past misfortunes. Drought, hail, and frost have of late years made serious inroads on the vinegrowers' income, and by the laws of ordinary probabilties we should have better times before us. Repeated failures are apt, however, to dull the energies of the best of us. Good tillage, careful pruning, general good husbandry, have not saved us from losses, though they may have minimised them; should we therefore cast them aside as unprofitable servants, and adopt the slothfulness of our less praiseworthy brethren? I think not. I would even say more than ever does it behove us to bestow on our vineyards the utmost care within our power. It is of little use disguising the fact, there are few vineyards to-day with the growth of a few seasons past. The plants have suffered, and, unless carefully tended, will take more than one good season to recover. Particularly let us remember that the forthcoming crop is largely dependent on conditions that obtained during the past spring and summer. Given at that time good conditions of growth, we might have hoped for heavy crops in 1901. But alas! the drought and the late frost proved a severe check on last year's growth, and with the best of treatment we can hardly hope for more than ordinary returns. All the efforts in the world will not contribute towards augmenting the numerical quantity of our berries. Good tillage will, however, increase their size and weight, and, perhaps, to some extent make up for past unsatisfactory conditions. Let us therefore remember that however promising the incoming season may prove, if we are to reap any benefit from it it will only be by seconding it by our own untiring efforts.

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And first, let us not neglect good proper tillage of the soil; successive years of drought have depleted the subsoil of what store of moisture it originally contained. Let us open it out early and deep and let in the soaking winter rains. How many are there who complain of the dryness of the springs and live in hopes of a wet October, that comes once in twenty years? Why not adapt themselves to the exigencies of the local climate, and store up the rain at that time of the year when it does fall? What would we think of the man who neglected to clean out the drains that fed his dams until October? And yet in practice this is what many growers do to the soil of their vineyards. They leave it hard and caked, covered with weeds that evaporate off the surface moisture, and do not open out the drains or furrows until October. Early cultivation may not have saved our vines from hail and frost, but at such a time as this less than ever can we neglect the evident advantages that accrue from it.

We may further help our vines by a judicious use of manures. Wherever the vines have made weak growth they should be used unstintingly. Unfortunately it is not at such low rates as prevail for cereals that they can be recommended here. A vineyard practically takes from the soil annually the equivalent of 3 to 4 tons of farmyard manure per acre. This substance is generally applied at the rate of 10 tons to the acre every three years. If grape skins are used they should be used at the same rate Farmyard manure, however, is generally beyond the reach of vinegrowers. In its stead we must fall back on the artificial manures that may now be readily obtained here. European experience would appear to show that vines required but little phosphatic manures, but that they were benefited in growth by nitrogenous manures, and in fruit by potassic manures. It does not necessarily follow that such results will also be found to obtain here. For the last three or four years I have been trying to test various manures at Roseworthy, but the seasons have been against us, and I can bring forward no satisfactory results. I have used as much as 10cwt. of sulphate of ammonia to the acre, and yet had no appreciable results therefrom. The same may be said of potassic manures. In some few cases superphosphates and other phosphatic manures have given some slight results. The drought, however, has been too persistent to enable us to draw any definite conclusions, and beyond recommending the use of superphosphates as an experiment, I cannot go. Four to five hundredweight to the acre should be tried.

There is again a dearth of rooted vines in the land, and those intending to extend their areas will have to fall back on cuttings. Of late years seasons have certainly been unfavorable to this method of planting, and if September and October are again dry the percentage of successful strikes must continue disappointingly low. It should be remembered that successful planting largely depends on a proper preparation of the soil. The latter should be broken up to a good depth as early as possible, so as to give it time to settle before the cuttings start emitting their roots. To late opening up of the soil must often be attributed failures in planting; it has not become sufficiently moistened by the winter rains, and in settling down it drags the tender roots, thus doing away with any chance of success that may originally have existed.

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Pruning should be prosecuted vigorously during the incoming month. Let us beware of leaving too much wood on weak vines. Wherever the plants have suffered the spurs must be reduced in number, and in many instances rods will have temporarily to be done away with. Where the frosts did serious damage last spring pruning will be no easy matter. Water shoots will have to be availed of, as little or no fruit wood will be obtainable. Wherever this is the case advantage should be taken to improve the shape of old vines by doing away with gnarled old arms, formed of little else but dead wood.

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The Phylloxera Board has now been in existence for some months, and has put into working form the machinery for the inspection of our vineyards. It has constantly been thrown in our teeth by our neighbors that, though we called ourselves a clean colony so far as the phylloxera was concerned, we had not proved the fact by a systematic inspection of our vineyards. It was even hinted by some (who ought to have known better) that the pest might have been imported into the other colonies from South Australia. Without inquiring whether such insinuations were prompted by ignorance or spite, it will be sufficient to say that if the phylloxera has been in our midst for the last twenty years it has lost all its venom and destroying power under our benignant climate. It must be recognised, however, that not for the sake of gratifying the curiosity of our neighbors, but for our own protection, a periodical systematic inspection of our vineyards has now become absolutely necessary. The struggle against the pest is now practically being abandoned by Victoria, and in a short while it will be bred in millions on the American resistant stock. Our present immunity is seriously threatened, and at any time the disease may be introduced in our midst. It is imperative that we should discover centres of infection as soon as they appear, and this can only be done by an efficient inspection. It is satisfactory to know that with the close of the inspecting season the inspectors had discovered no signs of the dread disease within our territory.

ORCHARD NOTES FOR JUNE

By George Quinn, Horticultural Instructor.

The season thus far has in most fruit-growing areas been favorable to tillage operations. Good soaking rains, followed by warm fine weather, have given an opportunity to throw open the soil to receive the rain and to be exposed to the weathering effects of the elements. In average districts in this colony the fruitgrower who has not already ploughed or dug his orchard should lose no time in doing so.

Although one season ahead cannot be foretold by reading the course of those which have preceded it, there is every reason to expect that during this and the two months immediately following most of our rain will fall, and though it may sometimes seem like wasted energy to urge the general adoption of the practice, I am fully convinced of the wisdom of deep, rough ploughing in early winter.

Certainly a rough footing will be left for the pruner, but better the pruner should stumble than the trees suffer for lack of moisture when the critical crop-maturing period comes around in summer.

The preparation of soil for future planting can be undertaken expeditiously now that the subsoil is fairly moistened. The methods applied successfully vary with each different soil, or more correctly with each subsoil. Where the subsoil is naturally well underdrained through porous strata the surface soil should be thoroughly pulverised and the sub-layer stirred for a depth which will aggregate about 15in. or 18in., including the surface layer.

Soils overlaying limestone crusts should be relieved of the crusts and the rubble beneath broken, but not brought to the surface more than can be avoided. Heavy cold clay subsoils should never be prepared by simply digging holes for tree setting. Such holes are drowning traps, or, to use a homely illustration, they form pots, from which there is no chance of repotting the root-bound or sodden plants. Such subsoils have one safe remedy, and that consists in under-drainage by artificial means. Whether the drains are laid with stones, slabs of wood, or earthenware pipes, they should be put lower than the soil is broken.

If asked from which the most permanent good could be obtained, deep trenching, or mere subsoiling, and draining, I would most emphatically hang my faith on drainage.

An early start with pruning is often advocated many weeks prior to this. I can conceive no reason for such action, excepting that a very large area may have to be covered, and to complete it in reasonable time an early start is needed.

It sometimes occurs to my mind that the conservation of moisture is often neglected until a ruinously late period, because the orchardist is anxious to finish pruning before the ploughing begins.

Whatever may be the reasons advanced for early pruning, it is certain that in damp localities many peaches and apricots cast vast numbers of flower buds during the progress of winter, and the early pruner may thus be embarrassed by the characteristics of the variety; but it is quite hopeless to enter upon any prolix explanations respecting methods of pruning.

A few general principles might be cited with profit to the beginner. In dealing with young trees any sparing of the knife usually ends in a similar manner to the child upon which the rod has been laid but gently. That is, the progress is rapid, but unballasted.

Trees that are well shaped and strong but which stubbornly refrain from fruiting should not have their leading growths pruned short. This only aggravates the difficulty, and results in a multiplication of these long fruitless shoots; but a reduction in the number rather than placing all on a level will yield best results.

In pruning peach and apricot trees it is a safe calculation to leave many more flower buds upon each spur or shoot than will be permitted to produce and mature fruits. A margin of fruits to be thinned later on is thus assured in most instances. In cutting the leading shoots of these kinds, select top buds to be left which indicate the further extension of each limb in a desired direction; do not cut them in such a manner as to cause next season's leading shoots to be bunched in one part of the tree, while other parts show spaces unnecessarily wide between these shoots. In other words, maintain as even a balance as possible around the crown. In cutting laterals of the peach, or spurs of the apricot, always cut above a good, healthy, plump wood bud, one not associated with bloom buds if possible.

The planting of deciduous trees will still be in full swing, though I am convinced the early fall planted trees are most favorably treated. Every hole in which a tree is set should be made to accommodate the roots. When trimmed, the roots should not be forced to fit a hole made on preconceived ideas of the space the root system shall occupy.

The harvesting of citrus fruits will be well started, and any meant for distant markets, or storing, should be carefully cut from the trees and stood in shelter to toughen the rind by permitting free evaporation of moisture therefrom. After this, if intended to be stored finally, they must be carefully sorted, and any blemished or thorn-pricked specimens put out for immediate sale or use. Oranges treated thus, and packed like eggs in bran in ordinary packing cases, have been kept six months with a loss, from decay, of about five per cent. This was done by a gardener who did not think he had accomplished anything worthy of remark.

Pieces of last year's shoots, well ripened, should be selected and labelled for scions in the grafting season. They should be half buried in soil, damp, but not saturated. Cuttings of quinces, figs, and mulberries, could be made and protected in a similar manner until time permits the grower to set them out in the beds.

When old trees have been budded in autumn, and the buds are still dormant, the piece of limb of the stock should be cut away a little above the inserted bud.

In pruning old trees care should be taken to cut all wounds closely, especially broken stumps of limbs on apple or pear trees. This precaution avoids the entrance of decay germs as well as codlin moth larvæ and other noxious insects.

NOTES ON VEGETABLE-GROWING FOR JUNE.

By George Quinn, Horticultural Instructor.

Vegetables of all kinds are growing freely. The value of nearly all kitchen vegetables depends upon the degree of succulency imparted by the rapidity of growth. When growing healthily, garden crops are in a condition to assimilate larger quantities of plant food than when comparatively dormant.

For this reason the time is now opportune for the application of quickly-dissolving manures.

For crops such as cabbages, cauliflowers, turnips, kohlrabi, and onions, all of which are gross feeding plants, a light top dressing of nitrate of soda, or sulphate of ammonia, sprinkled beneath or near the plants and hoed in will prove highly beneficial.

This also applies to peas and beans when just started to grow well, but afterwards these leguminous crops are able to forage for nitrogen by means of soil or root-inhabiting bacteria.

Superphosphate is another fast dissolving manure which can be supplied in the manner above described with distinct gain to celery, onions, potatoes, turnips, cabbages, cauliflowers, parsley, lettuces, peas, beans, and beets.

Carrots, parsnips, and lettuces thrive best upon land which has been heavily manured for some preceding crop, but in which a good residue of plant food has been left. Carrots and parsnips are, however, benefited by a top dressing of a quickly-dissolving fertiliser just as the young plants begin to grow well, or it may be mixed with the soil used in covering the seeds.

Lettuces are peculiarly sensitive to injury if chemical manures are used rashly upon them, and this applies to nitrate of soda particularly.

Sowings should still be made in drills of carrot, onion, parsnip, turnip, beets, and all growing crops of these must be rigorously thinned if good results are to be obtained.

Peas should be sown towards the end of the month, to supply the spring crop.

The small plots of cress, radish, prickly spinach, and parsley should also be sown, for maintaining a succession of these much-used vegetables.

Cabbage, cauliflower, Brussels sprouts, kohlrabi, onion, and lettuce plants should be transplanted as soon as they are ready. Bulbs of shallots and garlic are also planted during this month.

The mounding of celery must be constantly followed if clear blanched stalks are desired.

The preparation of land for planting asparagus could be undertaken now if time permits. It should be trenched at least 2ft. deep, and the subsoil kept below in its natural position. While thus preparing the ground, a barrowful of well-rotted barnyard manure, or a couple of pounds of bonedust, or 3lbs. of Thomas phosphate, should be worked and mixed into each couple of square yards of the soil thoroughly. This vegetable is usually planted from 1ft. to 18in. apart in rows which are 2½ft. apart in the beds. Beds with two or three rows only are best, as the surface can be worked without necessitating much trampling upon it. The old yellow stalks should be cut from established beds of asparagus, and a top-dressing of well-rotted manure to a depth of a couple of inches be given. About 2ozs. of common salt per square yard should be added to this dressing, as the asparagus relishes soils of a slightly saline character.

Rhubarb beds should be prepared in a manner much like those intended for asparagus, and the quantities of manure could be increased in the preparatory stage.

During the winter season root action is much encouraged by the frequent stirring of the surface of the soil between pretty well all kinds of vegetables. This must be done, of course, only when the surface is dry enough to avoid excessive adhesiveness to the tools.

Soils that are of a direct clayey character would be rendered more workable by being dressed with lime—say ¼lb. to the square yard. This can be sprinkled between the plants and may be lightly hoed in, to avoid being washed away only, as it naturally penetrates. Besides its physical action on the soil it will also aid in releasing plant food therein, which has hitherto remained not available to the roots.

VITALITY OF SEEDS.

An erroneous idea prevails in many quarters that old seeds of some varieties fo plants are preferable to new, because, it is supposed, they produce larger plants and more prolific fruitage. Another very fallacious theory is that shrivelled seed is "as good" for sowing as sound plump grain would be. No kind of seed is improved in any way by being kept over one season, and many sorts of seeds lose their germinative nature if kept over one season. Acorns and a few other seeds will not germinate if kept longer than a few weeks, and there are other seeds—especially those of an oily nature—which will keep good for several years, but are not *improved* thereby. Some of the more honest of seedsmen make a practice of burning the greater part of their stock at the end of each season, and thus maintain their good name and reputation. Others procure new seeds to mix with the old ones, and thus make an "average" of germinative quality. This may or may not be profitable to them, but it is not satisfactory to the purchaser. Because so much depends upon the vitality of seeds. everyone dependent in any way upon the results from sowing ought to test them before putting them in the soil. This is by no means a difficult matter. Two saucers and two circular pieces of thick flannel are required. Place one piece of flannel in a saucer, count out 100 sound seeds and distribute over the flannel; lay the other piece on top of the seeds; damp the flannel with lukewarm water—previously to putting on the seeds is best—then cover all with the other saucer, and keep the lot in a fairly warm place. Most varieties of seeds will sprout within four or six days, and all sorts should do so within a fortnight. From day to day remove the seeds that have sprouted, until all expectation of further results is past, keeping careful record of the number, and thus the average percentage may be computed. It may be necessary to supply a little lukewarm water occasionally to the flannel. Some seeds may require three weeks to a month to germinate. Beets, mangolds, and some other seeds are contained in capsules or pods, and where from three to seven seeds are contained in one envelope or receptacle it is necessary to separate them before trying the experiment. The following commonly-used seeds retain their vitality from two to eight years:—Beans, three; beet, six; cabbage, five; carrot, five; celery, eight; cucumber, ten; maize, two; lettuce, five; sweet melon, five; water melon, six; turnip, five; tomato, four; squash, six; pumpkin, four; radish, five; pea, three; parsnip, two; onion, two. Charlock, and many similar oily seeds, may retain their vitality, even if buried deeply in the soil, for many years.

POULTRY NOTES.

By D. F. Laurie.

Many are in doubt as to the preferable course to pursue in the matter of obtaining new blood in their poultry yards. Some argue that it is risky to subject birds to a long journey during the cold weather; others state that they have but indifferent success in hatching eggs obtained from a distance. Now, as regards obtaining birds of any sort of poultry, if they are in healthy condition when forwarded, and properly packed, they will arrive in proper order, but from that time, if any loss occurs, it is the fault of the purchaser. As many readers will be either receiving or dispatching birds during the coming season, it may be worth while to give a few hints on the subject. It is preferable to deal, if possible, with a well-known breeder; but where this cannot be done, the system adopted in England of depositing the purchase-money with a third party is a good one. Unfortunately many unreliable people advertise birds and eggs for sale, and birds have been supposed to be excellent specimens when generally they were mongrels of a bad type, and for utility purposes not worth keeping Then there is another class of advertiser, who has birds bred from prize-winners; the shows at which the prizes were won proving to be obscure country fixtures, where the competition, if any, was very limited. As a rule no value attaches to such prize-winners. Few judges have the moral pluck to refuse a prize to an unworthy specimen. Other sellers describe all reputedly pure-bred poultry as "prize poultry," which is again misleading to the novice.

Many honorable breeders and owners of excellent stock may not know the proper method of packing birds for a long journey. Wickerwork coops are very cheap in Victoria and New South Wales, and are universally used there; they are also very light and easy to handle. With the exception of a ventilation opening at the top, these coops are covered with new bran bagging or scrim. This is porous and provides sufficient ventilation with the top outlet, but no draughts are admitted. Failing such coops, a good travelling coop can be made of a large shallow case with four uprights of sufficient height that, when covered with bagging or scrim, the birds can stand erect. Birds should not travel after a heavy meal. An excellent plan is to take half a loaf of very stale bread, soak it for a time, and then suspend it in the coop. On extra long journeys, if an extra loaf is attached on top of the coop with a notice to the stationmaster, &c., at the intermediate stopping place, there is little doubt that the official will be good enough to soak the bread and pass it in to the coop from the top. Although it may at first sight appear cruel to say so, it is better to let the birds endure a little hunger and thirst on the journey than let them run the almost certain risk of violent diarrhœa if given wheat, and water different to what they are accustomed to. On arrival, the birds should first of all be carefully examined; first, for insects, especially the poultry tick (Argas reflexus), and secondly, for symptoms of disease. Various small poultry lice are at times to be found on the head and round the vent, and at the root of the tail; if very numerous, suspicion as to the bird's constitution may be entertained. If only a few are present, which should not be the case with a careful breeder, apply equal parts of kerosene and oil with a small sponge or piece of rag. One species, about an eighth of an inch, or less, in length, and of a yellowish-grey colour, apparently sharp pointed at each end, invariably denotes a delicate constitution, and are very difficult to get rid of: they are quick in their movements. Ticks are found on various parts of the body, especially under the wings. They are of a purplish-black color, and vary in size from 1/32in. to ¼in. in length; they have eight legs and a very small head. When they get on a bird they insert their proboscis, or beak, deep into the tissues, and hold on tenaciously; in fact, they often appear as if buried under the skin. They can be detached, however, but sometimes the head comes off. No greater calamity can happen to a poultry breeder than to have his yards and houses infested with the pest. They live in crevices of woodwork, masonry, and brickwork. They can live without food for over eighteen months. If the new arrivals pass muster as regards freedom from vermin, they must then be examined for disease, or temporary indisposition. A dark comb as a rule denotes mischief, generally in the form of diarrhœa. In such cases there will generally be signs of looseness of the bowels. Watery, greenish, frothy evacuations point in this direction; yellowish, bilious-looking motions point to liver disease. Diarrhœa may be checked by administering from four to six drops of chlorodyne or Perry Davis's painkiller twice a day in a teaspoonful of water. Soft food, such as boiled bread and milk, dredged over with powdered chalk and charcoal, will do the rest. A few drops of tincture of cascara twice a day in water will cure the liver, the food to be the same as above. Until acclimatised, all birds should be fed on boiled bread and milk. For drinking, give boiled water, to which may be added some solution of sulphate of iron (copperas) or Douglas mixture.

Solution of Copperas (Sulph. of Iron).—Dissolve 2ozs. in a pint of boiling water in an earthenware jar. When cool, add two tablespoonfuls to each quart of drinking water. Douglas mixture is made as above, with the addition of ¼oz. (fluid) of sulphuric acid. Use the same quantity.

Poultry should always smell sweet. A musty, sour, or objectionable smell denotes chronic liver disease in some cases, while in others, especially if accompanied by discharge from the mouth and nostrils, roup in some form may be suspected. Birds which have apparently recovered from a severe attack of roup, generally emit an unpleasant odor, and are unsafe to breed from. Canker may be known by cheesy deposits on the side of the beak, and in the mouth. These may be removed with a piece of blunt deal, and powdered burnt alum, or borax applied. Flowers of sulphur is a good remedy also. When, however, the windpipe opening is affected, and evil-smelling ulcers on the tongue, &c.,

are found, the case is more serious, either diphtheritic roup or true diphtheria. A free and frequent application of sulphur, also fumigations with carbolic acid vapor have proved effectual. In all cases the birds should be strictly quarantined. Even if the bird appears satisfactory in all respects, quarantine it for at least a week; if not, a very bitter experience will one time be gained. As to the legal aspect, anyone selling diseased poultry deserves the highest penalties.

It is as well to ascertain from the seller the kind of house the bird slept in, or whether, in the case of fowls and turkeys, they slept in trees, or, if ducks or geese, in the open yard. Sudden changes are dangerous. Extra ventilation and absolute freedom from draughts are necessary for birds used to sleeping in the open. If these simple rules are adopted, it is evident that it is preferable to purchase a pen of birds, as there will be many clutches of eggs during the season, and a change of blood can be obtained the following season at small cost.

As regards eggs, if they are properly packed they will travel hundreds, even thousands of miles, and then hatch well. Eggs, to stand a journey, and the accompanying shocks, &c., must be fresh; newly-laid if possible. Each egg should be well rolled in soft paper and packed in paper shavings or soft, dry grass, or straw. The box should be well lined with the above and the eggs standing on end; screw on the end and address legibly The words, "Eggs with care, this side up," may also be added. No abnormally large, or very small, or deformed eggs, should be selected. They should be well washed and then dried with a soft, clean cloth, so as to present an attractive appearance; fractures are then more readily detected. On arrival at their destination, carefully unpack and examine each egg, and then stand on the large end for from twenty-four to thirty-six hours to rest before being placed under the sitting hen. All nests should be on the ground; hollow out a shallow depression, place a layer of lime and ashes, and then line with soft grass or straw. It is as well to examine the eggs by lamplight. If the air chamber, generally at the larger end, is small, the eggs are fresh; if very large, they are stale and probably will not hatch. Test on the fifth or seventh day after being under the hen for fertility. Breeders generally replace unfertile eggs which are returned to them. If, however, an embryo is found dead in the egg, it is taken as conclusive proof that the fault is not with the seller; this, however, is not always a correct view of the case. Always remember, when inspecting chicks of a breed you are not familiar with, that you learn from a qualified authority what they should be like before blaming the seller. When Langshans were booming I often saw most insulting letters to honorable breeders because the chicks came the proper color, viz., black, white and canary; the novices thought they should at first be black, like the old birds. In other breeds the same thing has happened, and many a person, in his disappointment, has destroyed a valuable clutch of birds.

The season promises very well for the poultry industry, and it is to be hoped we shall soon be exporting regularly.

To Destroy Ants.—Ants can easily be destroyed by any of the following methods:—Bisulphide of carbon placed in the ground about their nests; Paris green, London purple, or other arsenical powder dusted about their nests or along their runs; or fresh lime spread about their nests occasionally. It is also stated that fresh air-slacked lime scattered occasionally around fruit trees will prevent the ants ascending the trees and spoiling the fruit. "White ants" in floors, &c., can be destroyed by dusting London purple or Paris green about the parts infested. The powder gets on the legs of the ants and is licked off by them, resulting in their death. The dead ants are eaten by their fellows, who in turn succumb to the poison.

VALUE OF BRAINS.

In a pamphlet (No. 16) published by the Agricultural Education Committee, of London, entitled "The School, the Farm, and the Garden," one paragraph, headed "The Value of Brains," states :—"It is generally admitted that superior education is the cause of Danish success in the dairy; or, as Mr. Thornton put it in his report—'The Danish butters, like Opie's colors, are good because they are mixed with brains, sir.' This means in hard fact about £8,000,000 paid to Denmark annually by England, because, though we have as good a climate and probably better cows, our dairymaids are not so clever and skilful. Or, to take another instance, a few years ago our importation of Danish eggs was insignificant; now it reaches nearly three-quarters of a million per annum. Meantime our agricultural classes complain of semi-starvation. The poorer of them turn their backs on the land and go to the towns; such as remain find country life so tedious and dull that they take no interest in it. No other markets in the world are equal to those of England. In 1899 we paid the unprecedented total of £184,584,796 for agricultural products, a great deal of which came, not from the virgin soil of new countries, but from France, Denmark, and Russia, that possess no natural advantage over us. With the markets almost at their elbows, our farmers can scarcely make a living; their servants are ill-paid and discontented, and land has gone down in value." It is slightly comforting to learn that our brothers in Great Britain are awakening to these facts, and are moving, although too slowly, in the direction of imparting sound scientific agronomical knowledge to their sons and daughters. But is there not abundant room for an active movement in the same direction throughout the whole of Australasia. South Australia has taken first steps in the movement; will she be checked in the advance by the cry "faddism" that is certain to be raised by a section of the community.

TILLERING OF WHEAT.

There are about 800,000 seeds in an imperial bushel of average quality wheat. There are 4,840 square yards in an imperial acre. This allows 158 seeds to a superficial square yard, or about 17·5 to a square foot. To enable a wheat plant to fully develop and to mature all its seeds, a sufficient area of soil is absolutely necessary. Under highly favorable conditions a single seed may and does develop 100 to 200 stems; but supposing only a dozen stems were produced, would a square foot of soil afford sufficient moisture and nutriment—to say nothing about room—for seventeen plants? Certainly not. Then, what must happen when seed is scattered so abundantly upon the field? We all know that good sound wheat will germinate 98 per cent. to 100 per cent. Then what becomes of the seed when from twelve to eighteen are dropped upon a square foot of surface? There is room for one or, at most, two to fully develop; they all probably start to grow, and soon begin to interfere with each other; the roots interlace and fight for the moisture and plant food in the soil. After a very short time only a few plants remain, and these grow up in competition, with insufficient nourishment and moisture, until maturity is reached by several puny, ill-nourished plants, with only three or four heads, in place of one or two strong, well-developed plants to each square foot, bearing a considerable number of large heads of full plump grain. At Wagga Wagga Farm, under Mr. George Valder, 4lbs. weight of seed drilled averaged 40bush. of wheat per acre. J. J. Mechi, Tiptree Hall, England, in 1848 obtained 80bush. of wheat from an acre sown with only 10lbs. of seed.

It has been argued that it is necessary to sow rather thickly because there is not enough moisture and plant food in the soil to properly develop the plant. It would be just as logical to try to feed eight horses with rations for one, because there is not sufficient for two.

With a really good seedbed, a firm but not compact or indurated subsoil, sound well-selected seed, and early sowing, 1 peck per acre drilled ought to be ample. With respect to seed, Professor Robertson wrote:—"Many farmers believe in changing their seed, the theory being that seeds run out and require to be changed from locality to locality. This is a mistake. The best and largest seeds should be chosen, and once chosen the farmer should stick to them. The largest and heaviest seeds germinate the best, and yield the heaviest crops." He brought forward several cases in evidence of this fact, amongst them being the following concerning the Meldrum wheat:—"Up in the Gatineau Valley, near Ottawa, there lived a farmer named Meldrum. His farm was in no way specially noted for growing wheat. He had several daughters, and they went into the fields and picked the big early ears of wheat from large vigorous plants. The seeds from these he cleaned and sowed for wheat again. He grew a remarkably fine crop, with a sample of which he won the gold medal at the Paris Exhibition, and for years it was sold as Meldrum wheat, and at high prices, for seed purposes."

STOCK NOTES.

The inspectors' reports for the March quarter show that a good deal of useful work has been done. Over 300,000 sheep have been examined and reported fairly healthy. The flocks inspected were found to be more free from tick and lice than has been the case hitherto. Dipping is carefully carried out, but there are still a number of sheepowners who neglect this important work. A few cases of worms have come under notice, and five cancerous animals were destroyed. Impaction and stomach staggers have been present in several instances, caused by sheep in low condition being removed from dry poor feed on to good stubbles and flooded ground. Footrot appears to have disappeared from the Wandearah district.

The inspectors have been also busy inspecting cattle. Of 25,000 examined, 157 animals were killed, being affected with tuberculosis, a large number being milch cattle. A number of working bullocks have also been destroyed. Teamsters have lost heavily, and have not been careful in destroying badly-affected animals. Working diseased bullocks with healthy ones, and herding them together has spread the disease to a serious extent in their teams.

There has been an increase in the number of tuberculous cattle destroyed, which, with closer inspection, is likely to continue for a time. To deal with this disease systematically, the Stock Department should have an officer engaged solely in testing the milking herds in the province, by which means doubtful animals could be isolated or disposed of with the best advantage to the owner, whilst badly-diseased animals would be destroyed. Several small herds have been tested with tuberculin successfully, but the large districts and duties of the staff prevent them from giving the time necessary for carrying out the test. In New Zealand many thousands of animals are now tested annually by special officers.

A number of the tuberculous animals have been also affected with hydatids, and in several instances animals have died from the latter cause only.

Twenty cattle have been destroyed affected with actinomycosis, and sixteen with cancer.

Only one outbreak of pleuro-pneumonia was reported; the animal died and the remainder were inoculated and quarantined. No deaths have occurred since, and the quarantine has been removed. Several lots of cattle have been inoculated.

In the South-East district the botfly has made its appearance. An application of kerosene to the parts of the horses on which the eggs were discovered was effectual in destroying them. If owners are careful in grooming and dressing their horses in the season in which the fly is prevalent, there should not be much trouble from this pest.

One hundred and twenty-six deaths from local ailments, such as impaction, indigestion, rickets, and asthenic apoplexy, have been reported. A serious loss of cattle occurred in one instance, which appears to have been caused by the animals being obliged to drink excessively foul water.

Horses are reported as healthy.

The drought in the North-East and Western Queensland has been so severe that but few stock have been introduced during the quarter, and there has been a short supply of fat stock in the markets.

Last year the Chief Inspector of Stock urged the necessity for an additional inspector being appointed in the interests of stockowners of the Central and Southern districts, and the Government, having considered the matter, appointed Mr. Robt. L. Winkler to the position. The inspector has now been at work for some weeks, with results which fully confirm the necessity for an officer inspecting the stock in these districts. Thirteen cattle have been destroyed affected with tuberculosis and pleuro-pneumonia. There have evidently been deaths from the latter disease some time previously. The inspector has already inoculated a number, and the country is placed in quarantine. He complains of the disgracefully dirty sheds in which cows are penned up for milking purposes. It is impossible that the milk can be taken from the cows in proper condition for use. Farmers supplying factories or making butter for sale will have to take some steps to cleanse their premises, or the produce must suffer in quality. Perhaps these dirty yards have something to do with "fishiness" in butter.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.
3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with:—
    1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid,
    2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.

3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. BATCHELOR, Minister of Agriculture.

FARM HINTS FOR JUNE.

By THE EDITOR.

The farmer who gets his seed in before the end of May stands a much better chance of reaping a good crop than another who delays seeding until later on. In the South-East the necessity to sow early is not so urgent. Where the soil is saturated it is worth while to delay until the soil becomes mellow.

Importers of fertilisers are already taking orders for supplies for next season, and it will be wisdom to order as early as possible. Many farmers failed to obtain the manures they wanted through delaying to order in good time last season, and, consequently, had to purchase manures which they considered to be of inferior quality, or to sow their seed without any fertiliser. Hard pan is as great a curse to farmers as are weeds. An effort should be made, directly after seeding is over, to break up the subsoil, but not to turn it up to the surface. If the subsoil is merely broken up into blocks or clods probably much harm will result, as moisture cannot be retained; but if it is broken down to a moderate degree of fineness, the water will soak in and be retained for a long time—especially if the surface soil is kept loose. Stiff clay soil can be very considerably improved by a liberal application of new air-slacked lime. Sandy soils will also benefit from a similar treatment.

White mustard sown now on land intended to be fallowed will be ready for feeding off by middle of July, or the crop can be ploughed under with the aid of a disc plough, with great advantage to the cereal crops, in either case, next season. Seven pounds of seed will be sufficient for an acre if sown by a drill.

Those who keep cows should provide ensilage. Pit ensilage is best for cows, and the pit should be got ready now. Circular pits show the least waste; but there is so little waste with square pits, and so much advantage, that the latter are to be preferred. A long, deep, narrow pit, divided across by 9in. brick walls, is very convenient. The divisions should be 8ft. to 10ft. square, and may be of any reasonable depth. The crop for filling the silo should have been sown ere now, and may consist of any plants that are nutritious and nice for the cows. The greater the variety the better for the cows.

Plant kail, thousand-headed cabbage, and cow cabbage in rows 6ft. x 4ft., on heavily-manured land, and keep the space between the rows every way frequently cultivated.

Prepare land for mangolds and beets by heavily manuring and deep and thorough tillage. On shallow soils the globe mangold, white beet, Silesian beet, or even the sugar beet will do better than the large mangolds. Where the soil is deeper the long red, the mammoth, and largest kinds will do best. On salt soils these plants will do well, but in some cases it may be necessary to raise plants in nursery beds now, and plant out in September or

October. The main crop of beet and mangolds should be sown next month. Sugar beets in rows, 18in. x 18in. apart; Silesian beets, 2ft. apart; large mangolds, 30in. apart. Five pounds of seed is ample for an acre. Plants must be singled.

Carrots and parsnips are valuable food for horses and cows as well as for human beings. The soil should not be newly manured, but should be deeply tilled, rich, and friable. About 7lbs. seed per acre will be sufficient.

Peas should be grown far more extensively than is the case here. They enrich the soil, but require a little manure in the soil to start the bacterial life which produces nitrogen as the plants gain strength. They will do well on calcareous and rather poor soils. Drill from 2bush. to 2½bush. of seed per acre along with a little rye or Tartar oats to support the plants. Sheep will eat the haulms and gather up every seed if allowed to do so. For fattening pigs there is nothing better than peas, and they may be fed together with the pea-straw. A fair average crop of peas should be 30bush., but much larger yields are sometimes harvested in Europe.

Broad beans should be sown in drills 2½ft. to 3ft. apart; 2bush. to 2½bush. of seed is sufficient for an acre. The leaves and stems are eaten by horses and cattle.

Sunflowers will grow on brackish soil, will yield up to 70bush. or 80bush. of seed under most favorable conditions. The large-seeded Russian variety is grown for human consumption in Russia, and seeds are eaten like nuts. Sow in rows 2ft. x 1ft. apart. The small-seeded variety is mostly grown for oil-making. The oil is used in very many ways, and the oilcake is superior to that from hemp or rape. The plant abstracts a deal of potash from the soil. Stems and leaves are eaten by cattle, and the stalks yield a superior fibre for paper-making. When left on the field the stalks decay rapidly.

Plant as many trees as possible, but protect them against damage by live stock. They will probably injure crops growing close by, but will amply compensate by protecting crops outside the influence of their roots.

Let the boars and sows run together now, as warm weather will come about farrowing time. The sire should be pure bred in every case, but the sow may be anything, so long she is of good size. The profitable pig is that one which makes the most growth in the shortest time on the lowest quantity of the proper kind of food.

EFFECT OF SEWAGE WATER ON RENNETED MILK.

By G. S. Thomson, N.D.D., Dairy Instructor.

Experiments have been in progress with a view to demonstrate a cause of stickiness in curdled milk and heaving and sponginess in cheese. Some cheesemakers in the colony may have observed a fibrous coagulation in patches on the surface of the milk after renneting, with small quantities of clear whey in the centre. The presence of the sticky curd is noticed during the process of cutting, when the curd immediately around the cavities of whey adheres to the knives in a fibrous manner and then tears away, causing damage to the texture of the coagulated milk, followed by loss in the quality of the cheese.

The above gives a description of what happened at a factory where I was engaged cheesemaking. This peculiarity had been previously under observation by the manager.

Believing that a kind of organism was the cause of the sticky curd, and had been introduced through contaminated milk, I determined to try and trace the source of the neglect.

Notwithstanding the abnormal condition of the curd, nothing unusual was noticeable throughout the process of manufacture: but towards the final draining of the whey and the removing of the curd to the cooler, the presence of a milky liquid oozing into the vat near the bottom attracted the attention of the manager and myself. After a close inspection we found a number of small holes through which the water had access from the steam jacket underneath. Immediately we had the vat removed and the holes soldered, also the jacket was thoroughly cleaned of the tainted milky-looking liquid.

After the work was over we made a brief examination of the cheeses in the curing room, and there a number of the new as well as the partly matured ones were heaving, some being very pronounced—a condition no doubt intensified by the warm nature of the weather at the time.

No further trouble was experienced with stringy curd, and heaving in the cheeses afterwards manufactured was only faint.

The investigation was not continued until a second occurrence was noted at another factory.

From information gained in the first instance, and the possibilities of sewage contamination affecting the milk in the factory in the second case, I conducted the following practical experiment.

A quantity of sewage water was obtained from a drain running from the cheesemaking room. Four sterilised jars were filled with measured quantities of pasteurised milk taken from one bulk.

Into Nos. B and D 3cc. of centrifuged sewage water was delivered by means of a sterilised measure, and thoroughly mixed by changing the inoculated milk and shaking it up in two other sterilised jars, afterwards returning it to B and D. A and C were kept as controls. Twelve hours afterwards the four jars were renneted (at the temperature of the milk, 64° F.) with 5cc. of Hansen's rennet, diluted with sterilised water, and the jars afterwards covered.

Plate I shows the specimens after coagulation :—

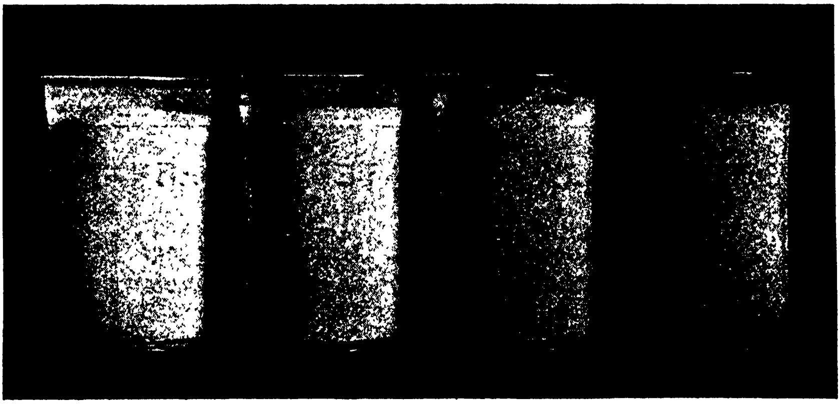

PLATE I.

The following morning the coagulum of the inoculated jars was beginning to rise, and three hours afterwards the whey was separated.

On the surface of the coagulated milk (D) the same night heaving of the curd was distinct, and on B numerous small holes, many covered over with air bubbles, were dotted all around the coagulum, as shown in Plate II.

PLATE II.
D—Forty-eight hours after renneting.

A B

PLATE III.
A and B—Fifty-four hours after renneting.

The control jars, or jars without the sewage water, were in both cases unaffected in appearance at the conclusion of the forty-eight and fifty-four hours.

Jar B was still heaving on the surface, and at the end of sixty hours the top was cut off with a sharp knife, and a fine honeycomb appearance showed itself, notwithstanding the sticky consistency of the curd.

A second experiment was conducted to bring about the stringy curd. So pronounced was the stringy condition in the curd after inoculation with the sewage water and renneting, that after three days from setting fine threads could be drawn inches above the surface of the curd, while the control jars were normal in adherence to parchment.

Further experiments were conducted with the whey from the stringy curd, and one jar of milk inoculated with the whey and afterwards curdled with rennet dissolved itself, leaving only a white decomposing scum on the surface.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of May, 1900 : —

Adelaide	2·24
Hawker	0·23
Cradock	0·31
Wilson	0·29
Quorn	0·88
Port Germein	0·37
Port Pirie	1·29
Crystal Brook	0·60
Port Broughton	0·74
Bute	1·29
Hammond	0·70
Bruce	0·48
Wilmington	2·12
Melrose	1·59
Booleroo Centre	1·09
Wirrabara	1·47
Appila	1·03
Laura	1·44
Caltowie	1·23
Jamestown	1·33
Gladstone	1·80
Georgetown	1·78
Narridy	1·17
Redhill	1·07
Koolunga	1·15
Carrieton	0·68
Eurelia	0·58
Black Rock	0·61
Orroroo	0·57
Johnburgh	0·26
Petersburg	0·64
Yongala	0·80
Terowie	0·47
Yarcowie	0·65
Hallett	1·58
Burra	1·03
Snowtown	1·16
Brinkworth	1·26
Blyth	1·90
Clare	2·47
Mintaro Central	1·40
Watervale	2·87
Auburn	1·86
Manoora	1·64
Hoyleton	1·46
Balaklava	1·66
Port Wakefield	1·36
Saddleworth	1·60
Marrabel	1·57
Riverton	1·96
Tarlee	1·48
Stockport	1·38
Hamley Bridge	1·41
Kapunda	1·87
Freeling	1·62
Stockwell	1·39
Nuriootpa	1·71
Angaston	1·35
Tanunda	1·99
Lyndoch	1·33
Mallala	1·91
Roseworthy	1·49
Gawler	1·08
Smithfield	1·96
Two Wells	1·56
Virginia	1·73
Salisbury	1·34
Teatree Gully	2·59
Magill	2·94
Mitcham	3·07
Crafers	3·43
Clarendon	4·60
Morphett Vale	3·10
Noarlunga	2·66
Willunga	4·13
Aldinga	3·69
Normanville	3·57
Yankalilla	3·70
Eudunda	0·89
Truro	1·20
Mount Pleasant	2·10
Blumberg	2·58
Gumeracha	2·51
Lobethal	2·61
Woodside	2·72
Hahndorf	3·34
Nairne	2·95
Mount Barker	3·34
Echunga	3·66
Macclesfield	3·54
Meadows	7·38
Strathalbyn	2·93
Callington	1·64
Langhorne's Bridge	2·23
Milang	2·45
Wallaroo	1·45
Kadina	1·02
Moonta	1·02
Green's Plains	0·74
Maitland	1·04
Ardrossan	1·28
Port Victoria	0·66
Curramulka	1·46
Minlaton	1·03
Stansbury	1·43
Warooka	1·64
Yorketown	1·48
Edithburgh	1·01
Fowler's Bay	2·00
Streaky Bay	2·87
Port Elliston	3·12
Port Lincoln	2·53
Cowell	1·28
Queenscliffe	1·65
Port Elliot	3·04
Goolwa	2·63
Meningie	2·02
Kingston	1·62
Robe	1·93
Beachport	2·00
Bordertown	1·32
Wolseley	1·63
Frances	1·76
Naracoorte	2·04
Lucindale	1·64
Penola	2·20
Millicent	2·45
Mount Gambier	2·39
Wellington	1·75
Murray Bridge	2·06
Mannum	1·46
Morgan	1·02
Overland Corner	1·04
Renmark	0·72

PRODUCE EXPORT DEPARTMENT.

The rabbit season opened on April 10 last, and during a period of forty-one days the department treated for export 15,043 crates, containing 375,916 rabbits. The *Wilcannia*, which sailed on May 3, took 2,202 crates, with 55,410 rabbits, as the first consignment for the season. The Anchor liner s.s. *Warrigal* received from the depôt on May 30, on account of various shippers, for London and Liverpool, 9,081 crates, containing 224,824 rabbits.

During the month 2,740 cases, containing 112,000lbs., or 50 tons of jam, were sent through the depôt, for South Africa.

For London depôt 3,189galls of wine were forwarded during the month; and per *Wilcannia*, on May 3, 30hhds. and 11 puncheons, or 2,999galls.; and per *Cuzco*, same day, 9hhds., or 600galls.; or a total of 3,599galls. by the two vessels—grand total of 6,788galls.

WEATHER AND CROP REPORTS.

Amyton.—Of late very little rain has fallen, and many paddocks have a wilted appearance. More rain is needed. The land has not had a good soaking rain for the year as yet, and some of the wheat sown deep in rough fallow has not come up. The rain in most of the districts round here, although early, was not sufficient in many cases to germinate the grain. Several frosts have occurred. Stock in fair condition. Feed at a standstill.

Angaston.—Up to the present a splendid season. Feed plentiful; stock in grand condition. Lambing proceeding satisfactorily. Heavy rains would be welcomed to fill dams. Seeding operations proceeding, and indications point to a good harvest. Crops are drilled generally, artificial manures being used.

Bakara.—Crops in fair conditition; more rain necessary. Stock in fair condition, but feed rather short.

Balaklava.—The weather during early part of the month was too dry; feed came to a standstill, and fears are entertained that some of the seed has malted. Seeding is practically finished. A good rain fell on the 17th, and since then showers have fallen nearly every day. Lambing has commenced, and, as we are having warm weather and no frosts, the lambs should get a good start. The prospects for the season are brighter than for some years past.

Barootа Whim. - Frosts have done considerable damage. Dry winds have caused seeding to be postponed, but early sown is up and looking well. Stock in good condition.

Booleroo South.—Weather excellent. Early-sown crops are growing well, and feed is coming on fast; seeding almost finished. Lambing has opened well.

Burra.—Good rains have fallen this month, making a total of 6·55 points for the year. The farmers have nearly all finished seeding. Most crops in this district are drilled in with manures. Grass is growing well, and with favorable weather there will be good feed for the winter. Lambing is good, and probably will be the best we have had for four years.

Crystal Brook.—The weather during early part of month was dry, with cold frosty nights, and feed and early-sown wheat have been retarded. Nice rains have lately fallen, which will give everything a fresh start. Rainfall for April 27th to May 17th, 0·58in.

Dawson. - The season is most discouraging; the wheat and grass that came up during April has all withered off, and grave fears are entertained concerning the seed, even should a good fall of rain occur soon. Goyder's line of rainfall is more clearly defined by the actual rainfall this year than has been the case for twenty years, and there are few in this locality who now think it safe to grow wheat outside that line. Stock are having a hard time, except where stores of cocky chaff and straw are available. Beef and mutton unobtainable owing to prohibitive prices. Owing to absence of green feed and high price of bran, &c., even cocky chaff fetching 6d. per bag, dairying is at a low ebb. Rainfall for year to date, January, 0·33in., February, nil., March, 1·16in., April, 0·27in., May, 0·16in.

Elbow Hill.—Splendid showers have fallen. Seeding almost completed. Feed plentiful, and stock in good condition. Rainfall for April, 1·27in.; for May to date, 0·87in.

Eudunda.—The month of May has been splendid from a farmer's standpoint. Fine weather to get the seed in, and 1¼in. of rain to start it. Feed is growing splendidly, stock looking well, and lambing has started well.

Finniss.—Weather for month has been dry, but towards the close good rains have fallen. Seeding is in full swing. Grass is growing well.

Forster.—Rainfall light for past month. Wheat and feed growing very well. Seeding operations in full swing. More rains wanted.

Gawler River.—Rains have fallen recently, doing considerable good to feed, which was getting short. Seeding almost finished. The use of drills is general. The early sown crops look strong. Lambing has commenced very well. Cattle in splendid condition.

GLADSTONE.—Fine weather has been experienced here, but have had a few light frosts. The weather to middle of month was dry, but splendid rains have since fallen. Crops are looking well. Good season expected.

INKERMAN—Owing to long dry spell of weather feed made no progress, and some crops were getting low. Splendid rains fell on 17th May, and crops have restarted. Seeding is drawing to a close.

JOHNSBURG.—Tilling was generally completed about the beginning of this month, and a larger area than last year is under cultivation. The weather is keeping very dry; no rain has fallen since March, consequently the young wheat is getting low for want of moisture, and the later sown is not yet up. Feed is very scarce. Stock in fair condition, being mostly hand feed. We have had severe frosts which checked growth of vegetation very much.

KOOLUNGA.—Seeding nearly finished; fallowing will start immediately. Good rains have fallen during the month. Crops and feed growing very well. A few light frosts experienced.

LIPSON.—Splendid seeding weather prevails; week ending the 12th of May brought fine rain, nearly 2in. fell. A quantity of fertilisers has been used this season. Feed is growing nicely; stock improving fast. Lambing has commenced with splendid prospects.

LUCINDALE.—Exceptionally fine weather has been experienced this month, alternating rain and sunshine. Early-sown barley is now fit to cut. Nearly all the ploughing has been finished, and early-sown crops are looking very well. Early lambs are looking very well, and stock on the whole is in good condition. There is every indication of this being an exceptionally good season.

LYRUP.—Splendid weather for seeding, but bad for raisin-drying. Seeding operations are in full swing; seed drills are generally used. Few frosts have been experienced. It is expected that a splendid season will follow.

MAITLAND.—Splendid weather for seeding, but in some parts rain is badly wanted. Feed is rather backward, owing to dry weather and cold nights. Many farmers are still carting water.

MILLICENT.—Weather during month has been most seasonable. Some early crops have come up nicely and look well. Farmers mostly busy with the seed drill and getting in their potatoes, some crops of which are turning out well. All stock look well; still good demand for all classes.

MOUNT BRYAN EAST.—Nice rains have fallen. Feed has started well. Seeding has practically finished. Stock, in most instances, is poor. Dams are still dry.

MOUNT PLEASANT.—Stock improving. Feed growing slowly owing to cold winds and insufficient rain Early sown crops coming up fairly well.

MOUNT REMARKABLE.—Early part of month exceedingly cold; frosty nights, cold cloudy days. The rain of last week proved of great benefit; weather now mild. Feed and crops growing well, the latter looking strong and healthy.

MUNDOORA.—A few showers of rain fell during May, and considering the very limited quantity the crops and grass are looking fair; but a good soaking rain is anxiously looked for. Seeding is almost finished, and in some paddocks the wheat is above ground. Working horses are in fair condition, but sheep and cattle are rather poor, and a very limited quantity of sheep is left, having been sold out during the summer months owing to scarcity of water.

MURRAY BRIDGE.—Since last report the weather has been dry. Grass began to wither, and ploughing went on badly, but about the middle of the month the finest rain of the season fell, 1¼in. being recorded. Grass again growing vigorously, and seeding operations are proceeding satisfactorily. Early drilled crops are growing evenly and look healthy and strong on clean land. Stock improving in condition.

NANTAWARRA.—Stock improving, but feed will not be as good as was expected a month since. The weather at the commencement of the month was very dry, and a few frosts cut the feed and crops on stiff clay land. Towards the middle of the month about 1in. of rain fell. Dams are getting filled.

ORROROO.—The weather is all that could be desired. Good rains, cloudy days, and foggy nights. About ·75in. of rain has fallen, which will do a great amount of good both to early and late sown crops. Feed for stock is very scarce, owing to severe frosts and the want of moisture until the last rains.

PENOLA.—Good rains have fallen during the month. No severe frosts have yet been experienced. Early sown wheat looking well. Pruning and ploughing in full swing at Coonawarra.

PINE FOREST.—Weather has been splendid for month. During the latter part of the month rains fell in small quantities almost every day. Crops progressing steadily, and seeding is almost finished. Feed is not plentiful, and is growing slowly. Stock in general is in fair condition.

PORT GERMEIN.—The weather for first two weeks of month very dry, but splendid rains have since fallen. The prospects for coming season are good. Stock in fair condition, and the lambing season has opened well.

Quorn.—Splendid rains fell on 17th of month, doing a great deal of good to crops, which had suffered severely for three weeks previous owing to dry weather. The rain was patchy, 0·25in. falling on the plains, and abòut 1·50in. in the hills. Seeding is drawing to a close.

Richman's Creek.—About 1in. of rain fell during the middle of the month. Feed beginning to look well, and crops are looking splendid, especially those drilled in with manures. Seeding is almost completed.

Riverton.—Prospects for season very favorable. Grass growing well on land manured last year. Good rains have fallen. Considered best season for seven years Stock in good condition and free from disease.

Robertstown.—So far the season has been all that could be desired. A fair amount of rain has fallen. Seeding is being pushed on with energy. A few drills are in use. Feed is becoming abundant. Everyone is looking forward to a prosperous season.

Saddleworth.—The season has opened most favorably. Seeding is well forward, a large quantity of manure, principally superphosphates, being drilled in. Over 7in. of rain has been registered this year, being above the average. Stock healthy and in fair condition; feed still short. Wheat chaff saved last summer is now valued.

Scales Bay.—About 2in. of rain fell during early part of month. Light showers have since fallen. Grass is growing well, but wheat not so well. Stock in fair condition, and rapidly improving, although fats cannot be procured. Wild dogs are troublesome among the flocks.

Wilson.—The rains have grown lighter as the season has advanced, and the little wheat that came up has in many cases dried off. There was not any quantity of feed, and if rain comes next month it will be too late to give us winter feed. Most people are thinking of moving stock, as their resources are exhausted. This dry time is terribly trying, coming on top of such a prolonged series of disastrous seasons.

Wilmington.—The beautiful rains of April put good heart into the agriculturist, and for some two weeks everything prospered; then followed dry weather with cold frosty nights, doing damage on the plain country; but the beautiful rain which has fallen recently has revived the appearance of things. Rainfall over 2in. Seeding on the plain is complete, but in our immediate neighborhood it will continue for some weeks yet Early sown crops are now looking strong and healthy. Feed for stock will now be very plentiful.

The Wool Clip.—The Sydney *Daily Telegraph* of January 5, writing on the Australian clip for 1899, says:—"While there was a shrinkage of 10,800 bales in the Sydney wool sales during the past half year, in Melbourne there was an increase of 6,500 bales; in Geelong, an increase of 20,600 bales; in Adelaide, an increase of 8,700 bales; and in Brisbane the sales were also larger. The Australian sales during the past half-year compare as under:—

	1898—Bales.	1899—Bales.		Bales.
Sydney	325,100	314,300	Decrease .	10,800
Melbourne	180,100	186,600	Increase..	6,500
Geelong	61,700	82,300	Increase..	20,600
Adelaide	61,100	69,800	Increase..	8,700
Brisbane	7,000	22,000	Increase..	15,000
	635,000	675,000	Increase .	40,000

At £19 per bale this 675,000 bales would run to £12,825,000, which to us appears near the mark, and probably full high. Taking the last year's sales at £11 10s., the 635,000 bales would then have represented £7,302,000, and the additional £5,523,000 dealt with in local markets certainly constitutes an important financial feature, and has affected the London exchange considerably. Still, in the end, it will be the value of the entire clip which will have to be considered, and in spite of the shortage here and in Queensland the advance in price will represent many millions sterling."

Forest Destruction.—So recklessly have some of the Indian forests been exhausted near the coastline that the Government has determined upon planting a large area with sheaoaks (casuarinas) to make a big fuel reserve. A commencement has just been made in Travancore. Some 1.800 acres, or three square miles, will be first dealt with, and if it promises well other waste lands will gradually be planted with the same kind of tree.

CENTRAL AGRICULTURAL BUREAU.

Wednesday, May 23, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Hon. A. W. Sandford, M.L.C., Messrs. Samuel Goode, W. C. Grasby, R. Homburg, M.P., H. Kelly, T. Price, M.P., T. B. Robson, and A. Molineux (Secretary).

Standard Sample of Wheat.

The Secretary Chamber of Commerce intimated that the Corn Trade Sectional Committee had no objection to take part in proposed conference on the question of fixing the standard sample of wheat.

The Secretary said it would be necessary for the Central Bureau to suggest names of three representative farmers, as well as three of its own members, to act on the conference. The Chamber of Commerce might be asked to suggest names of three millers or wheatbuyers. The conference could probably be arranged for some time next month.

It was resolved to appoint Messrs. S. Goode and J. Miller, M.P., with Professor Lowrie, to represent the Central Bureau, and to ask Messrs. W. Gleeson, of Carrieton, G. Stone, of Baroota, and R. Marshall, late of Templers, to act as direct farming representatives.

Winter Irrigation.

Mr. Thos. Hardy wrote suggesting that it would be a good object lesson if the Bureau could obtain, say, one acre of fruit trees and vines close to the main from Happy Valley, for the purpose of showing the effects of winter irrigation. The land should receive 3in. or 4in. of water during August. The water might be supplied by the department free of charge, and the experiment carried on for three years. He had seen the beneficial effects of winter irrigation in the Goulbourn Valley and elsewhere, and believed a practical demonstration here would be of great value to the fruit and vine growers generally.

The Secretary said he presumed Mr. Hardy's object was to show, first, that winter irrigation paid; and, secondly, to demonstrate whether it would be profitable to use water from the mains for the purpose. The experiment would cost but little, the water being the main thing, and would to a certain extent show whether the suggested use of the surplus water from the Onkaparinga for irrigation purposes on the Adelaide Plains was feasible.

After some discussion it was resolved that the Hon. Minister be asked to take steps to give effect to the suggestion, and, if approved, the work to be carried out under the supervision of a committee, consisting of Messrs Hardy, Robson, Grasby, and the Horticultural Instructor.

Pure-bred Bulls for Branches.

Mr. Sandford wished to refer to question of the bulls purchased by the Department of Agriculture. At present the department owned about twenty-three bulls, and fifty or sixty Branches wanted the loan of bulls. This meant that distinctions must be made, and it seemed to him that the department would be doing more permanent good by encouraging Branches to purchase bulls for themselves If the department would subsidise to the extent of say £1 for every £1 raised by a Branch for the purpose of buying a bull, he believed a number of Branches would avail themselves of the opportunity of obtaining good stock. He moved, therefore—" That the Central Bureau recommend to the Hon. Minister of Agriculture the advisableness of assisting the dairying industry by subsidising £1 for £1 Branches that will subscribe for the purchase of dairy bulls approved by an officer nominated by the Minister, such bulls to be available for reasonable use by the public at a fee of not more than 5s." He further moved—"That the bulls now owned by the Department of Agriculture be valued and offered to Branches in terms of previous resolution; Branches now having control of such bulls to have the first opportunity of acquiring them."

Mr. **Grasby** seconded. He believed the Department could do much more good, and at less expense, by adopting the suggestion, than by continuing the system of purchasing bulls to loan to the Branches. Only those who really desired to improve their herds would avail themselves of such an opportunity, and the people that were prepared to help themselves were the ones most entitled to help. Other members agreed that it would be better to adopt the suggestion, and so relieve the Department of any responsibility in connection with the bulls, and at the same time do away with the necessity for making distinctions between the Branches in the allotment of the bulls. The resolutions were carried unanimously.

Mr. **Homburg** said, in connection with this matter, it seemed rather inconsistent to help in purchasing pure-bred stock with the view to the improvement of the dairy herds, and at the same time do nothing to prevent the use of mongrels that left no stock of any value. This applied equally to stallions. He had on two occasions endeavored to get clauses inserted in the Local Government Acts, making it permissive for District Councils to require all bulls or stallions kept for hire to be licensed, but without avail. He knew the Bureau had also endeavored to secure legislation in this matter, and it was so important that he would bring it forward again at the first opportunity.

Extracts and Translations.

The **Chairman** tabled the following extracts and translations from Foreign Agronomical Papers:—

352. *Frozen or Cooled Milk* is extensively used in Germany and elsewhere on the Continent of Europe. It is sent into the towns from long distances in the country. As some of our South Australian butter factories are provided with refrigerators, it may be profitable to send frozen milk into Adelaide or Broken Hill when the pure article is scarce in those places.

353. *Nitrate of Soda from the Air.*—Professor Wm. Crookes, President of the Society for Electricity in Great Britain, being of opinion that the world will shortly require much more wheat than can be produced—if it is true that every year six and a half millions more persons demand bread made from wheat—thinks that we shall have to fall back upon nitrogen from the air. The mines in Chili are not so productive as formerly of nitrate of soda. Every square yard of the earth has a column of nitrogen in the air above it equal to 9 tons, which, however, is useless to plants (except leguminosæ). They can assimilate it only as nitric acid or sulphate of ammonia. By means of electricity, which supplies a sufficiently high temperature, Professor Crookes proposes to change this nitrogen, with the required quantity of carbonate of soda, into nitre, and if the mechanical power of a waterfall can be used as the source of the electrical energy, he presumes that the cost of 1 ton of nitrate of soda would be only 60 florins, against 96 florins, at which it is now obtainable.

354. *Perchlorate* is being found yearly in increasing quantities in nitrate of soda, and, as 0·43 per cent has been sufficient to injure crops of rye, it is certainly unsafe to purchase nitrate of soda containing that percentage or more.

355. *Water your trees* and obtain plenty of fruit. Trees do not bear where the subsoil does not contain sufficient moisture. It stands to reason that, where the subsoil is of a dry nature in our climate, and the roots have to rely upon rain water, the trees will have at times to undergo great distress, and this all the more where they are well clothed with leaves, which prevent any summer rains to soak readily into the dry surface. A tree may look well enough, so far as leaves are concerned, but the tree will keep these, and yet be compelled to throw off all its fruit. To ripen or even to set the fruit it may require twice the moisture. It is, therefore, of great consequence to irrigate a tree before it shows its blossoms, and in that case it is pretty certain that, given sufficient moisture also later on, you can force any tree to bear and ripen fruit provided it has set any. On hillsides, where the heavy winter rains may run off, it may be necessary to open shallow ditches above your rows of trees to arrest the flow, and even in the plains small holes some distance from the stem may allow the water to

soak in better. The trouble of carrying dishwater or other water from the kitchen or washing of the floors to the trees will be well repaid, where there are no other means of irrigating the trees; but the mere wetting of the surface is not enough, the subsoil must be reached.

356. *Potatoes*, their manuring, the climate, and mechanical state of the soil, are points to be considered if you expect the large crops which the new kinds of potatoes give in Germany. They frequently approach 17 and more tons per acre. As regards manuring, it is stated by Professor Dr. Maercker that while the soil, which is in good heart at the Lauchstädt Experimental Station, may produce 88cwts. per morgen of the potato named after himself, without manure, he can expect, with manure, as many as 186cwts.; or, of the variety "Silesia," up to 203cwts. It is, therefore, necessary to add so much plant food by manure to produce of the "Professor Maercker" potato the additional 98cwts. and for the "Silesia" 115cwts. per morgen (somewhat more than half an acre). To thus obtain say 100cwts. more the plants will require 58½lbs. of nitrogen, 24lbs of phosphoric acid, and 79½lbs. of potash. These figures are higher than what has been used in former years, because *the new varieties require more plant food* for their larger growth above the surface. If you intended to use commercial manures you would require therefore 4cwts. nitrate of soda or 3cwts. of sulphate of ammonia, 1½cwts. of superphosphate or Thomas phosphate, and 6½cwts. of kainit to supply the before-mentioned plant food, provided the plants could consume the whole of it. This, however, is not the case. They may be able to take up about two-thirds of the nitrate of soda, one-third of the phosphoric acid, and about 60 per cent. of the potash. It would, consequently, be necessary to increase the nitrogenous manure to either 6cwts. of nitrate of soda or 4½cwts. of sulphate of ammonia, the phosphoric acid to be 4½cwts. of either phosphate and the potash to 11cwts. of kainit. Such quantity of nitrogen in the form of nitrate of soda would, however, not only be distinctly injurious and too expensive, but 11cwts of kainit would injure the mechanical state of the soil, and the starch in the potato would become very low on account of the very large quantity of magnesium chloride and sodium, amounting to about 44 per cent. It is, therefore, impossible by such means to obtain the largest crop, and we have to fall back upon farmyard dung and green manuring. Professor Maercker used the manure from three-year-old steers, that were to be fattened. Where the manure was kept for four months under the steers in a deep stable it required 100cwts. of it to produce 39cwts. more of potatoes than where not manured. Where the 100cwts. of manure from similar steers was removed every second day, and kept on a dungheap, although properly trampled down by cattle, only 15¾cwts. more potatoes were harvested than were not manured. If 150cwts. of manure had been used, the increases in the crop would have been respectively 57¾cwts and 23·1cwts ; yet it would require in even the first case 90lbs. more of nitrogen, 29lbs. of phosphoric acid, and 53lbs. of potash to obtain the greatest crop, and these can be given in 2cwts. of nitrate of soda or 1½cwts. of sulphate of ammonia, 2cwts. of superphosphate or Thomas phosphate, and 1¼cwts. of the "new kainit," which contains 40 per cent. of potassium sulphate. Where the excess was only 23·1cwts. over the unmanured morgen of land these quantities of commercial manures would have to be increased to 4cwts. of nitrate of soda or 3cwts. of sulphate of ammonia, 3½cwts. of superphosphate or Thomas phosphate, and 2½cwts. of the "new kainit." This shows the absolute necessity for obtaining the very best stable dung for growing potatoes, and I am afraid, most of our dung being horsedung, it is not so safe to use as cowdung. Potatoes are, however, very grateful for green manuring, so well shown by the late Dr. Schultz-Lupitz. Professor Maercker sowed a mixture of horsebeans, peas, and vetches after the summer crop was harvested. This might be done here, when there is a sufficient rainfall in March, and the potatoes are not planted before the commencement of August or later. In good loamy soil you might obtain up to 80lbs., and in a very favorable year 100lbs. of nitrogen per acre. In a lighter soil Professor Maercker used blue lupins. One hundred and twenty pounds of Vicia villosa per acre, with 80lbs. of rye later drilled in, furnished in Germany as much nitrogen after the wheat was harvested and the crops ploughed in by May next. Unfortunately, this and other kinds of green manuring can only be used here in somewhat exceptional instances, and the results are much more uncertain than they are in Europe. Yet, if we expect to obtain the grand crops which the new kinds of potatoes can bring, we will have to use the best dung or green manuring, supplemented with commercial manures. Of these latter it is probable that not less than 2cwts. of nitrate of soda or 1½cwts. of sulphate of ammonia, 1⅝cwts. of superphosphate or Thomas phosphate, and 1¼cwts. of the new kainit will be required, when this latter is obtainable in the market a few months hence.

357. *Dipping Potatoes* to protect them against the fungus Peronospora infestans and others, Professor Frank and also Millardel, of Bordeaux, advise to dip them five or six weeks before planting for twenty-four hours (no longer) into a mixture of sulphate of copper (bluestone) and lime, in the proportion of 2lbs. of bluestone to 1lb. of lime.

358. *Magnesium.* - Of late years this is more and more valued as a plant food. Much is found in dolomitic marl. The large production of grain in a sandy soil where lime and magnesium is used is most remarkable, and the same results can be obtained with magnesium nitrate against an equal quantity of potassium nitrate. With the latter, however, the quantity of straw was much greater. Straw requires more potassium nitrate, and the grain

more magnesium nitrate. An application of both has, therefore, given good results for both grain and straw. As regards the different kinds of potash Professor Maercker gives many results. He used for barley potassium chloride (or muriate), which contains also magnesium sulphate and magnesium chloride and obtained 90·10g. of grains against 30·75g. without it: silicate of potash gave him 72·65g.; potassium sulphate, 77g. In adding about 1½cwts. of magnesium chloride, calculated at per acre to any of the before-mentioned manures, he received with muriate 96·05g.; with silicate of potash, 99g.; and with potassium sulphate, 92·45g. For potatoes the pure potassium chloride was favorable. Kainit interfered greatly with the starch through the 31 per cent. of sodium chloride (common salt) in it. The "new kainit" will probably not act so injuriously, although I do not know as yet how much common salt it contains.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Meadows, Mr. F. W. Dohnt; Gladstone, Mr. C. Goode; Tanunda, Messrs. J. Gurr and C. F. W. Lehmann; Port Elliot, Messrs. O. B. Hutchinson, H. Gray, and R. E. Ulrich; Port Lincoln, Mr. Jas. C. Richardson; Dowlingville, Mr. Frank Lock; Crystal Brook, Mr. P. Pavy; Boothby, Mr. D. Sims; Watervale, Mr. H. T. Bartlett; Forster, Mr. John Jones; Riverton, Messrs. W. B. Davis, W. Kelly, and A. S. Martin; Inkerman, Mr. C. E. Daniel; Johnsburg, Mr. J. Read.

Reports by Branches.

The SECRETARY reported receipt since previous meeting of 73 reports by Branches.

REPORTS BY BRANCHES.

Morphett Vale, May 3.

Present—Messrs. L. F. Christie (Chairman), H. Anderson, T. Anderson, F. Pocock, G. Goldsmith, and A. Ross Reid (Hon. Sec.).

REPORT.—The Hon. Secretary reported that thirteen meetings had been held during the past sixteen months, with an average attendance of over eight members. Seven papers had been read, and Professor Lowrie had given one lecture to farmers under the auspices of the Branch. Steps have been taken to raise funds to deal with the bird pest.

FARMING AS A BUSINESS.—The Hon. Secretary read a paper to the following effect:—

The object of the average farmer is to make his farm yield a profit. A farmer has stated that it paid him to purchase some of his land at £12 per acre, because the crops gave him 15 per cent. interest on his money. He did not reckon his own labor. Another says it pays to grow a certain crop, because it more than pays for the labor; but he fails to reckon interest on cost of his land. Any work done should pay for interest on cost of land, for labor, and any risks. It is doubtful whether it pays to house any implements except, perhaps, the binder, seed drill, and such machines that would warp with the weather. It does not pay to house iron implements such as ploughs and harrows. A shed will cost £30 to £40, and to secure interest on that would require a saving of £2 per annum on the account for ploughs, harrows, scarifiers, and similar iron implements. The question must be, "Which is the most profitable thing to do?" A good new fence looks well, but if there is a bad crop inside it would have been better to have rubbed along with the old fence and spent the money on manure. The best way is to make money out of the profitable things first, and then, if there is money to spare, indulge in the luxury of good tool sheds, new fences, &c. A good sheep and cattle proof fence can be erected in this district for less than £20 per mile. The usual fence here costs £45, and in one case £56 per mile. It will, perhaps, last thirty-six years, and the cheap one will last as long. This means £1 per annum, besides the interest on the cost, the difference of which comes to about £2 10s. per annum per mile, or a total difference of £3 10s. per mile per annum It takes, roughly, one and one-third miles to enclose a section, so the difference in cost would mean £4 13s. per annum, or an extra rental of 1s. 1½d. per acre. This is a luxury, especially as the cheap fence is fully as effectual as the other.

The fence costing less than £20 is similar to those erected by Mr. Peter Waite three years ago on his northern sheep runs. "Waite's" special No. 10 wire was used, and was now as tight as at first. Posts were 60ft. apart, six wires, with three wooden droppers between, swinging clear of the ground; strainers 140yds. apart, stays to strainers not less than 12ft. long and 4in. thick. Members said steel wire rusts out more quickly than drawn wire. Mr. Christie said he had never used smaller wire than No. 8, and had been advised by Mr. T. Dodd never to use less than No. 6.

PLOUGHS.—All members agreed that it is necessary to loosen all set screws on ploughs before leaving the ploughs for a time. Mr. Goldsmith does not think it pays to house or to paint iron implements. The Chairman believed it pays to grease iron mouldboards, but not to house any but wooden implements, machinery, &c.

Carrieton, May 3.

Present—Messrs. W. J. Gleeson (Chairman), G. Martin, R. Fuller, sen., W. H. Byerlee, F. Kaerger, J. F. Fisher, and J. W. Bock (Hon. Sec.).

SEED EXPERIMENTS.—Mr. Fuller tabled two very large fruits of Mikado tomato, and Mr. Kaerger showed fruits of Helios tomato grown from Bureau seed, and stated it was a splendid bearer and fruits of good flavor. Bush marrow did well, being very prolific, but the fruits did not average more than 3lbs. Of the cucumbers he had tried he preferred the Formosa Climbing; it was fruitful, of good flavor, and did not require much water. Red and White Kaffir corn grew well without irrigation, but very few stalks headed; sorghum was destroyed by locusts; Hungarian and Pearl millet were absolute failures.

STANDARD SAMPLE OF WHEAT.—In reporting on proceedings of the Quorn Conference the Chairman referred to this matter and a long discussion ensued. The members were unanimously of opinion that the present method of dealing between the merchant and the producer was not exactly fair to the latter, as he did not get a fair price for wheat above the standard.

ONIONS RUNNING TO SEED.—The Hon. Secretary wished to know how to prevent onions running to seed. [Probably due to inferior seed, but sometimes because sown and planted too early. Cut off the seed stem directly it starts. Procure good reliable seed next season.—GEN. SEC.]

Mundoora, April 20.

Present—Messrs. T. Watt (in chair), W. Tonkin, C. Button, W. Mitchell, D. Owens, J. Loveridge, J. J. Vanstone, W. T. Torr, W. J. Shearer, and A. E. Gardiner (Hon. Sec.).

SALTBUSH.—Mr. Tonkin applied for and will be supplied with some seeds of saltbush, with instructions for growing same, by the General Secretary, Central Bureau.

WHEATS FOR DRY DISTRICTS.—Mr. Vanstone wished to know whether the four varieties of wheat sent out by Central Bureau lately were grown by Mr. R. Marshall, of Templers. [Yes.—GEN. SEC.]

OLD SEED WHEAT.—Mr. Owens wished to know whether there is any advantage in keeping seed wheat for a year before sowing. The Hon. Secretary said he had tried the experiment once, but could see no difference between the crop raised from that or from new wheat. There was risk from mice and other contingencies to be considered. [All seeds deteriorate more or less from being kept.—GEN. SEC.]

EXHIBIT.—Mr. Loveridge tabled a sample of Leather-jacket wheat, which had done well with him last season.

Port Pirie, April 14.

Present—Messrs. P. J. Spain (Chairman), T. A. Wilson, T. Gambrell, T. Johns, G. M. Wright, W. Wood, and R. J. Ferry (Hon. Sec.).

Stock Traffic.—The Traffic Manager informed members by letter that if anyone wishes to forward stock to Adelaide he should give notice to the nearest stationmaster within the regulation time.

Steam Thrashers.—Mr. Johns advocated the co-operative purchase of a steam thrasher, to be placed in charge of an experienced man, to thrash for the shareholders.

Wool-classing.—A class was formed for the study of wool-sorting under the tuition of Mr. G. Jeffrey.

Meadows, May 7.

Present—Messrs. J. Catt (Chairman), T. A. Buttery, G. Ellis, G. Rice, W. Pearson, G. J. Stone, T. D. Brooks, D. D. Murphy (Hon. Sec.), and two visitors.

Show.—The Hon. Secretary reported that the show recently held in connection with the branch was thoroughly successful.

Paper.—Mr. Pearson read a paper on "How to Make our Meetings more Instructive and Interesting." Every member should recognise his individual responsibility towards the business of each meeting. They should all be regular and punctual in attendance, and each in turn should read a paper or initiate a discussion on some interesting and practical subject. The ordinary rules of debate should be enforced by the Chairman. It was resolved that these suggestions should be carried out.

Preparation of Land for Potato-growing.—Mr. Pearson said that as a rule growers of potatoes do not start soon enough to prepare the soil. A start should be made during May by ploughing under any green stuff there is upon the land. He had ploughed rye, over 12in. in height, and found that it made a good green manure. Chemical manures should be ploughed in now, and use another dressing before planting. He advocated "dry irrigation," that is, thorough cultivation, as it is impossible to have soil too fine. Thoroughly pulverised soil never becomes dry. He would not plant potatoes before August, as the young plants would be liable to severe injury from frost. Mr. Buttery said the more the land is cultivated the more satisfactory the results. Other members agreed that the land cannot be worked too much when dry.

Mount Gambier, April 24.

Present—Messrs. J. Watson (in chair), W. Barrows, James Bowd, M. C. Wilson, W. Mitchell, T. H. Williams, J. C. Ruwoldt, E. Lewis (Hon. Sec.), and W. L. Summers (Inspector of Fertilisers).

Freight on Potatoes.—The Chairman reported on action taken in regard to reduction of freight on the railway for produce. As a result the freight on potatoes to Adelaide had been reduced 2s. 1d. per ton. Some discussion took place as to who was benefiting by the reduction. Buyers did not give any more to the growers, and the price to consumers had not been reduced.

Branch Show.—The Secretary reported unfavorably on prospects for proposed show of produce in connection with the Branch, and it was decided to let the matter drop.

Importation of Plants.—Mr. Bowd complained of action of the Department of Agriculture in reference to the importation of plants and seeds. The plants were subjected to fumigation with sulphur and were destroyed. He thought the local postmaster should be allowed to fumigate parcels of plants for Mount Gambier district coming from the other colony. In reply to questions by Mr. Summers Mr. Bowd said the first lot of cuttings he complained about were ordered two years previously, and the second about twelve months later. Mr. Summers pointed out that the system of fumigation had only been adopted for about twelve months, and then sulphur was not used, but materials that with proper care did not injure the plants if they were in good condition. It was not practicable to carry out suggestion to have plants fumigated by the local postmasters. To be of any protection against the introduction of phylloxera and other pests the work must be done in Adelaide under skilled supervision. In regard to statement that the cuttings were destroyed by fumigation the fact that nurserymen continued to import plants and cuttings of all sorts was evidence that they were not injured by fumigation.

Exhibits.—Samples of apples grown by Mr. Lane, of Tantanoola, were tabled for identification, also twenty-five named varieties from Coonawarra Fruit Colony, all of good quality.

Stock Diseases.—In reply to questions, Stock Inspector Williams said nothing new had cropped up in regard to death of cattle at Dismal Swamp, and he was still of opinion that the organisms in the water drank by the cattle were the cause of death. Traces of similar organisms had been found in another waterhole, but they were not numerous. He also wished to refer to the matter of tuberculous stock. During the past quarter nine cases of tuberculous udders had come under his notice. The udders only were affected in some instances, and as a previous case had occurred in at least two of the herds he was satisfied that the disease had been conveyed from the diseased cow to the healthy animals by the hands of the milker. As a preventive he strongly recommended washing of the udders and teats both before and after milking. It was quite possible that the germs would find lodgment in the cracks in the teats. Mr. Williams asked that better facilities should be given him for his bacteriological researches. He suggested a small portable room, in which he could work at night, as he was busy in the day time with other work. Members considered the work done by Mr. Williams had been of great value to the district, and decided to ask the Government to grant sufficient money to put up a small room.

Burra, April 27.

Present—Messrs. W. G. Hawkes (in chair), E. Goodridge, F. Duldig, Jas. Scott, J. A. Arnold, and R. M. Harvey (Hon. Sec.).

Wool-classing.—Arrangements in connection with lecture by Mr. George Jeffrey on this subject were dealt with. It is expected that a good class will be formed under Mr. Jeffrey's instruction.

Exhibits.—Mr. Goodridge tabled good samples of onions grown at Leighton by Mr. T. Goodridge. A return equal to 2 tons 6cwts per acre was obtained.

Colton, May 5.

Present—Messrs. P. P. Kenny (Chairman), B. A. McCaffrey, A. C. Riggs, W. L. Brown, M. S. W. Kenny, W. J. Packer, W. McElder, W. A. Barnes, Jno. Shepard, R. Hull (Hon. Sec.), and four visitors.

Analyses of Bluestone.—Members considered the result of analyses of samples of bluestone sent to Central Bureau to be satisfactory, and did not think it necessary to send sample from this district. The members also thought it would act as a deterrent if the Central Bureau were to have a few samples analysed each season.

Bunt.—Discussion on this subject took place. Members wanted to know how it was that the confusion of names, bunt and smut, arose. Were the two names properly applied to one disease, or were there two diseases? [They are two distinct parasitic fungus diseases of cereals.—Gen. Sec.] Mr. Brown said he found that if wheat was well wetted with any liquid and then left to dry thoroughly before sowing it remained free from bunt. If seed were pickled some time—say a month—before sowing there would be no fear of the crop being bunted. The Hon. Secretary said he had advocated the same thing. He believed if seed wheat were pickled as soon after harvest as convenient and stored in a dry barn, the crops would be quite free. Members were agreed that it was no good sowing directly after pickling, as the bunt plant would gain entrance into the wheat plant, whereas if pickled and allowed to dry the bunt spore germinated and perished, leaving the seed wheat free from any spores likely to affect the plant when it grew.

Standard Sample of Wheat.—Members could not find fault with the sample adopted by the Chamber of Commerce as the standard for the season, or with the manner adopted to arrive at the season's average. Rather they considered the farmers to blame for sending inferior samples to the Chamber. At the same time the members regretted that inducement was not offered to farmers to clean their wheat better.

Late Sowing of Wheat.—In reply to question as to how late it was advisable to continue seeding in this district, members considered seeding should be finished as soon as possible after the end of May.

Exhibits.—The Hon. Secretary tabled some splendid cucumbers grown from Bureau seed. All the varieties sent had done well, but the Princess and Japanese Climbing were exceptionally good.

Port Lincoln, April 20.

Present—Messrs. W. Laidlaw (Chairman), J. D. Bruce, J. O'Shanahan, R. Sullivan, Dr. Kinmont, and J. Anderson (Hon. Sec.).

Standard Sample of Wheat.—Members considered small sealed sample sent out through the Central Bureau to be a fair sample of the season's wheat. Discussion took place *re* methods of disposing of farmers' produce, it being agreed that the present methods placed the producers at a disadvantage in many ways.

Amyton, May 9.

Present—Messrs. Joseph Gum (Chairman), Wm. Gum, Thos. Gum, John Kelly, A. Gray, H. Gray, H. Turner, R. Brown, Wm. Mills, Wm. Hawke, Wm. Hughes, A. Stone, S. Thomas (Hon. Sec.), and six visitors.

Stock Complaints.—It was decided to keep a book recording symptoms of various stock complaints, together with treatment and remedies. Mr. H. Gray asked for remedy for large round worms, and Mr. Thomas Gum recommended a wine glass full of turps in a pint of raw linseed oil.

Poultry Keeping.—Mr. H. Gray read a paper on "The Cost and Profit of Poultry-keeping," to the following effect:—

Owing to bad seasons many farms have not been profitable, and farmers have been driven to consider by-products. Amongst these he thought poultry one of the best paying, and one that involves the least amount of labor. Ducks, geese, and turkeys are difficult to rear in the

North, on account of the dry climate and absence of green feed. Turkeys and geese are also destructive about the farm yard. He started the year with ninety fowls, but only thirty-eight were laying hens first year. They laid 563doz. eggs during the year; average 14¾doz. each hen, and the average price was over 7¾d. per doz., equal to £18 4s. 6d., or about 9s. 7d. per hen for the thirty-eight.

EXPENDITURE.	£	s.	d.
Feed for all fowls for twelve months	8	3	6
Eggs used for hatching	1	4	2
Kerosine for incubator	0	7	6
Total	£9	15	2

INCOME.	£	s.	d.
Eggs laid by thirty-eight fowls—563doz., average 7¾d.	18	4	6
Eggs laid by pullets	2	10	11
119 fowls sold, average 1s. 4½d. each	8	3	9
Fowls in hand, about 100, at 1s. each	5	0	0
Total	£33	19	2

This shows a profit of £24 4s. for the labor and interest, &c. Two portable houses are placed on the stubbles, and these save all the feed for three months or more, and the hens lay well if they have shade and plenty of clean water. A bag of clean wheat fed forty-five fowls just one month, and the eggs laid and sold during that month, at 4½d. per dozen, realised £1 5s., leaving a profit of 15s. with wheat at 10s. per bag. One bushel of wheat will feed a hen for a year if she is running at large. Fowls, however, must have attention paid them in cleanliness, feeding, water supply, and gathering up the eggs regularly. Clean wheat should be chiefly used, but soft feed with a little green hay chaff (scalded) mixed with it is a good substitute for grass. Use pollard with a little bran for chickens; they will leave any other food for that, and thrive on it. If a farmer could keep 300 laying hens he would realise, probably, 8s. to 10s. per head net each year, provided he kept only young hens. Old hens do not pay to keep, as they get fat and fail to lay. It is very difficult to cull out the old fowls; but perhaps it would be a good plan to have three different fowl houses and make the young chickens of each year roost in one particular house, and then they will keep to it at night. The best laying breeds should be kept, such as Leghorns or Minorcas. Common fowls crossed with Leghorns last year were satisfactory, and these crossed with Brown Leghorns may probably give a good laying strain. They mature very quickly, and begin laying at four and a-half months, both cross-breds and pure-breds. With these non-sitters it is necessary to have an incubator, without which it is not possible to get early chicks, which always thrive better than late ones. Chicks should be reared early in July, August, September, and not later than October, as they are liable to get diseases during hot weather and do not thrive; again, early chicks begin laying when eggs are dear. Six years' experience has proved the practical value of incubators and foster-mothers. The chicks do better than with hens and are free from vermin; besides this, the hens would be laying instead of sitting or nursing the chicks. For breeding purposes, isolate fifteen to twenty of the best laying hens, and then it will be necessary only to keep two pure-bred roosters of a good laying strain. It does not pay to keep any but the best laying strains. The charge for carriage and expenses connected with sale of fowls from here to Broken Hill comes to 6d. per head, so it requires a good return to make up costs and losses through exposure in open trucks. Many fowls are killed by the heat and exposure in these trucks, and it is thought that the railway people ought to provide a shady, ventilated truck once or twice a week during summer for fowls consigned to Broken Hill. It pays to pickle eggs when the price falls to 3d. per dozen. He had sold such eggs six months after at 1s. per dozen and over, and they were almost as good as fresh eggs, though the shells crack when boiled. If farmers were to co-operate, or if they could sell through the Farmers' Union, in Adelaide, Broken Hill, and elsewhere, it would be possible to escape the enormous charges made by the present salesmen, such charges as "advertising," "booking," and so on. The average of 7¾d. per dozen is a very low one, but was that given by the storekeepers?

MANAGEMENT OF POULTRY.—Mr. S. Thomas followed the above with a paper on "Management of Poultry." The following is an abstract:—

Poultry are second only to wheat for profit, and the profits do not fluctuate as do those from every other source. Profits are not much affected by droughts, but depend almost entirely upon good management. A good laying strain may be obtained from white, brown, or buff Leghorns, Hamburgs, or any of the Spanish varieties; then, by careful selections of the best layers, and by penning them in a small wire-netted paddock, and hatching only from their eggs, a first-class laying strain may be obtained. With care these will give from seven to eight sittings per annum per fowl. Good management includes (1) a judicious system of feeding, to secure a constant supply of eggs—especially during winter—and to maintain the health of the birds in summer; (2) housing and shelter, with a view to economy in feeding: (3) selection and marking, with a vigorous system of weeding. Many farmers give too much fattening food. A superabundance of wheat—especially if it is plump—makes the hens too fat, often resulting in an invasion of the ovary, and thus decreasing, or even suppressing, egg-production. Give, therefore a variety of food. When there is plenty of green grass very little else is necessary except a liberal supply of crushed bone—1lb per day for each fifteen hens. In absence of a bone crusher, remove the top and bottom of a kerosene can, fix it on a frame with a flat slab or stone at the bottom, and crush the bones with the end of a crowbar, as used for ramming fence posts, till the pieces will pass through a ¼in. mesh sieve. It should take no more than an hour to fill a 2gall. bucket. [One hundredweight of best bonedust can be purchased for 5s. 6d.—Gen. Sec.] When there is no green grass it is absolutely necessary that its place be supplied, and the best substitute is very green chaffed hay, cut to ⅜in. or ½in. lengths, steamed or scalded, and mixed with crushed wheat and bran, or pollard. Good wheat soaked in warm water, covered with a damp bag till it sprouts is good; boiled wheat may be given occasionally. A mixture of 4lbs. bran with 1lb. linseed meal makes a good summer feed. It is comparatively cheap, a good egg-producer, and a mild aperient. Shrivelled wheat is better than plump grain in summer. It is a great mistake to allow poultry to roost in trees, as it is then impossible to rid them of vermin, and it takes a much larger quantity of grain to produce a given number of eggs, because so much of the food is needed in that case to maintain animal heat, and this can be provided more cheaply in the shape of a good fowlhouse. Galvanized iron is preferable to stone, and it can be readily removed to another spot if required. All timber should be built on outside of the house; the bottom ends of the iron should be sunk into the concrete, of which the floor of the house should consist, and the front should always be open. Light removable houses, of galvanized iron, should be used for the breeding yards. Perches should be 2in. x 2in. hardwood, suspended by small fencing wires. The droppings should be frequently removed to a distance, else disease will result. A house 8ft. x 20ft., with two perches the full length, will suffice for fifty fowls. Plaster of Paris nest eggs are preferable to porcelain. Mix the plaster and fill into empty eggshells; they keep longer than hen eggs

Mr. Gray said the eggs in an incubator require only five minutes attention each day besides filling the lamp. Mr. Wm. Gum said cross-bred fowls lay better than pure-bred, but other members claimed that this only applies to birds reared for show purposes, although cross-breds are often the hardier birds, but this is not necessarily the case, and often results from in-and-in breeding. All members agreed that a covered ventilated truck ought to be provided for safe transit of poultry to Adelaide or to Broken Hill. The Hon. Secretary maintained that chickens will thrive when raised in summer if proper attention is given them. They must not be over-crowded, but must have good shelter, proper feeding, and cool clean water. Sudden changes of temperature, nocturnal thunder and rain storms were the chief causes of roup and cancerous roup which at present was making havoc amongst poultry For the last six years, since he had provided proper shelter, he had been free from roup amongst his fowls, but prior to that he had lost 180 head from roup.

Scales Bay, May 5.

Present—Messrs. J. J. Roberts (Chairman), R. S. Thomas, W. J. Thomas, D. P. Thomas (Hon. Sec.), and four visitors.

Standard Sample of Wheat.—Members were unanimously of opinion that the sample sent out by Chamber of Commerce was inferior to the average for this district. Members believed that if an average sample of all the wheat grown in the district last season were taken it would be cleaner and considerably heavier than the "f.a.q." sample. They also considered that if any of them took the sample sent out by the Chamber of Commerce to a miller or wheatbuyer he would be docked to the extent of 2d. per bushel on account of "smuttiness." Members favor the adoption of a system of grading, No. 1 grade to be 66lbs. per bushel; No. 2, 63lbs.; and No. 3, 61lbs. There was a lot of wheat grown on new or good land which, if properly cleaned, would average 66lbs. per bushel, but under present conditions growers would get no more for such wheat than for wheat weighing 63lbs., so that if they had poor wheat as well it pays to mix it all together, so as to get an average of 63lbs. This does not enhance the reputation of our wheat. Then again, if a farmer had wheat going 64lbs. to 65lbs. he would probably be able to bring it up to 66lbs. by more thorough cleaning, to the benefit of himself and the colony generally, if any inducement in the shape of an increased price were offered. It was resolved that this Branch considers the single standard is not conducive to the welfare of the colony; that there should be three grades; that a committee of farmers, millers, and wheatbuyers should be appointed to deal with the matter before next harvest, and that the Central Bureau and the Farmers' Co-operative Union be asked to take up the matter in the interests of the farmers.

Best Wheats.—Members considered Steinwedel, Rattling Jack, and Purple Straw the best three wheats for this district. Steinwedel has during the past few years averaged best, principally owing to the dryness of the spring and early summer. Rattling Jack was a good late wheat, standing up well, yielding a good sample, easy to reap, and prolific. Purple Straw was a good average wheat in this district, either for hay or grain.

Clean Seed.—Members complained of difficulty experienced in obtaining pure seed wheat, due to the different varieties grown on the one farm being reaped with the same machines without careful cleaning when starting on a different variety to that previously reaped. The winnowers would also retain a few grains, no matter how careful the farmer might be. Then the practice of feeding the horses with "cocky" chaff made it nearly impossible to prevent the introduction of foreign seed into the crop.

Stansbury, May 5.

Present—Messrs. A. Anderson (Chairman), P. Anderson, J. Henderson, C. Faulkner, H. C. Pitt, J. Antonio, G. Jones, and P. Cornish (Hon. Sec.).

Season.—Members reported that the early rains have enabled farmers to push on with seeding under favorable conditions. Feed was coming on well, and everything pointed to a fine season for lambs.

Exhibits.—Mr. Faulkner tabled some fine grapes which he had protected from the birds by means of wire-netting.

Wool-classing.—During the past month Mr. G. Jeffrey visited the district, and under the auspices of the Branch delivered a lecture on "Wool and Wool-classing." It was decided to form a class on wool and wool-classing.

Export of Lambs.—Members wish to call attention to the question of exporting the best of our lambs to England. The trade was rapidly increasing, and last season over 75,000 lambs were shipped. Unless great care was exercised the best lambs would be picked out for export, and the flocks generally would deteriorate. Members consider that some of the best ewe lambs should always be reserved for breeding purposes.

Paddocking Pigs.—Mr. Antonio asked whether pigs would do better running loose in the paddock or kept in pens, providing they are fed the same. One member expresssed the opinion that the best way would be to sow a small paddock with some root crop that would grow well in the district, and have a few litters when the crop is mature, allowing them to run in the paddock for a time, then fatten them up with corn for market.

Bluestone.—Chairman tabled sample of bluestone. Decided to ask Central Bureau for some simple plan for testing purity of bluestone. [Simple tests are given in August, 1899, issue of *Journal of Agriculture*, page 90.—Gen. Sec.]

Quorn, May 10.

Present—Messrs. R. Thompson (Chairman), Jas. Cook, G. Altmann, W. Toll, C. Potter, and A. F. Noll (Hon. Sec.).

Field Trial.—Arden Vale Branch wished to arrange a trial of disc ploughs, harrows, &c. This (Quorn Branch) is willing to co-operate, but would greatly prefer a general field trial of cultivating implements.

Tuberculosis in Cows.—The Hon. Secretary read a paper on this subject, and concluded that it is far more important that an agriculturist should prevent disease from infecting his family, through infection from his dairy stock, than it is to conduct experiments with manures, &c. If a farmer or other person keeps cows it is his imperative duty to see that they are perfectly healthy. As the disease may be present, but not detected, in any cow, it is absolutely necessary to subject all milk to a temperature of about 200° F. for five minutes, in order to destroy any germs of the tubercle bacillus that may be present. If the temperature is raised above 200° the milk will acquire a peculiar taste; if below 185° the germs may not be killed. Dairy cows should be tested with tuberculin from time to time, as this will infallibly indicate whether or not tuberculosis is present. The Hon. Secretary tabled the surgical instruments, thermometer, and tube of tuberculin as used in the test. Members wish to discuss the subject at a larger meeting.

Pine Forest, May 8.

Present—Messrs. R. Barr, jun. (Chairman), J. Flowers, G. Inkster, W. H. Jettner, and F. Masters (Hon. Sec.)

Non-attendance.—Names of two members were struck off the roll on account of non-attendance. It is considered that if any members are not sufficiently interested in the work of the Bureau to attend at least one meeting in three, or send an apology for absence, the Branch will be better without them. The rule *re* attendance will be strictly enforced in future.

Combined Branch Show.—Three delegates were appointed to attend combined Branches show committee at Port Broughton.

Standard Bushel of Wheat.—A long discussion ensued upon this subject, in which the oft-repeated ideas were enunciated, and members unanimously adopted the idea of permanent standards of 64lbs. and 62lbs. for first and second grades of wheat.

Millicent, May 3.

Present—Messrs. R. Campbell (Chairman), H. Hart, B. Varcoe, H. A. Stewart, W. J. Whennen, W. R. Foster, H. Warland, F. E. Wehl, H. Oberlander, G. Mutton, and E. J. Harris (Hon. Sec.).

Annual Meeting.—It was decided to arrange for a social in connection with the annual meeting of the Branch in June, and to invite Professor Lowrie to attend and give an address on "Manures and Manuring."

Rye for Pigs.—At previous meeting Mr. Foster suggested feeding rye in the straw to pigs, but some members doubted that the grain would hold in the straw. He now tabled bunch of rye in the ear which had been exposed to the weather, but the grain still remained intact.

Foxes.—Mr. Stewart called attention to the suggestion to put strychnine in the mouths of dead parrots, &c., and lay them along a trail made by dragging sheep or other skins, in order to poison foxes, which were again becoming very troublesome.

FODDER PLANTS.—Mr. Hart called attention to practice adopted in New Zealand of growing gorse or furze as fodder for sheep. The land was ploughed in crowns, 4ft. apart, and the seed sown on the crown. Sheep were put on to graze the plants down while young and tender. As the plants increased more stock were put on, so that the shoots were never allowed to get hard. Attention was directed to the fact that a few plants of gorse on the Penola Road were kept down by rabbits, which appeared to obtain a good deal of food from these bushes. The tree lucern, or tagosaste, was recommended by some for cultivation in this district. It grew well, and sheep and cattle became very fond of it. So also did the rabbits, even barking the trees, so that it would be necessary to wire-net any paddocks so planted.

Cradock, May 12.

Present—Messrs. R. Ruddock (Chairman), P. Gillick, B. Garnet, J. Turner, J. Patterson, P. O'Dea, R. Solly, W. Haggerty, J. H. Lindo (Hon. Sec.), and one visitor.

SEED WHEAT.—Chairman stated that wheat in this locality came up irregularly, some later than the rest. Unpickled wheat is slower in germinating, but appears to withstand dry weather better than pickled seed. Mr. Gillick said pickled wheat comes up weaker than unpickled, but gets stronger afterwards. Mr. Garrett said wheat which grows strongly and vigorously at first does not withstand dry weather as well as does the slow and weaker growing plants.

MINERAL PHOSPHATIC ROCKS.—Members are desirous to obtain specimens of the mineral phosphates in the original unmanufactured state, to enable them to identify similar formations should such exist in the neighborhood. [There are about thirty sources from which natural or mineral phosphates are manufactured, and each of these presents several different appearances. It would be instructive were there a full collection of these phosphatic rocks, &c., on view in Adelaide, but up till the present time no such collection exists here. It would not be possible to provide such collections for each of the institutions that would be likely to ask for them.—GEN. SEC.]

OFFICERS.—Messrs. Ruddock and J. H. Lindo were thanked and re-elected Chairman and Hon. Secretary respectively.

Dowlingville, May 11.

Present—Messrs. R. A. Montgomery (Chairman), T. Illman, W. T. Holland, G. Inkster, T. Kenny, R. Foggo, G. Mason, H. P. Crowell, J. L. Broadbent, T. Lombladt, F. W. Roberts (Hon. Sec.), and three visitors.

PICKLING SEED WHEAT.—Mr. Holland read a short paper in which he said the best way to pickle seed wheat is to get a cask large enough to hold 4bush. of seed. Make a solution of 1lb. of pure bluestone for each 10galls. of water (or 2lbs. in 15galls. if the seed is slightly smutty), by suspending the bluestone in a piece of branbag 1in. below the surface of the water. Pour sufficient of the solution into the barrel. Place the barrel on a stage, so that the solution can be drawn off through a plug-hole at bottom, into a tub. Then pour the wheat into the top barrel of solution, skim off bunt balls and light rubbish floating on surface, let the seed remain eight to ten minutes to soak, draw off surplus liquid by means of the plug, and then empty the seed on to a clean floor. [The pickle drawn off is of the full strength, and no more bluestone should be added to it.—GEN. SEC.] Mr. Foggo said he first poured his seed wheat into a trough of water, stirred it for about five minutes, then baled the seed out with a perforated kerosine tin, placed it in bags, left it there twenty-four hours, by which time the bunt balls were dissolved, then pickled with bluestone to destroy the spores.

OFFICERS.—Messrs. John Phelps and J. L. Broadbent were elected Chairman and Hon. Secretary respectively, and past officers were duly thanked.

Tanunda, May 11.

Present—Messrs. J. H. Walden (Chairman), W. Graetz, G. Mann, P. Trimmer, C. Heinemann, E. Trimmer (Hon. Sec.), and one visitor.

PRIZES FOR VINEYARDS.—Two prizes of £5 and £2 10s. were offered by the Adelaide Wine Company for the best cultivated vineyards of not less than five acres. Entries up to September 30th, judgment to be made during December. It was decided to hold a vine-pruning competition during June, with substantial prizes, open to all comers.

EXPORT OF APPLES.—From Nuriootpa alone 5,163 cases of apples have been packed for export during the present season.

Mount Remarkable, May 10.

Present—Messrs. A. Mitchell (Chairman), G. Yates, C. E. Jorgensen, T. P. Yates, J. B. Murrell, H. B. Ewens, D. Roper, and T. N. Casley (Hon. Sec.).

"THE FARM AND ITS PRODUCTS."—Mr. D. Roper read a paper on this subject. The following is a short abstract of his contentions:—

Nearly every farm possesses capability to materially increase the income from by-products; but these possibilities are not always availed of. Sheep are now so universally regarded as part of every well-equipped farm that there is no need to dilate upon this subject. Dairying is now receiving more attention, but not nearly as much as it deserves. In many cases only a few cows are kept for the womenfolk to attend to, and it is not uncommon to hear that four or five cows fail to supply enough butter and milk for the farmer's own family. It should be a part of the farmer's own work and intelligent consideration to make a profit from the cows. They must be well bred, from a good dairy strain, and close in-and-in breeding must be avoided. The animals must be regularly and sufficiently fed all the year through to keep them constantly strong and in good condition. The milking must be regularly and completely conducted. The dairy must be suitable and appliances up to date. The skim-milk and waste must be utilised for feeding pigs and poultry. [Mr. Roper here prepared an imaginary schedule of receipts and expenditure on a dairy herd of ten cows, showing a profit of £36 2s. 6d. for twelve months, after paying for labor, interest, and all other costs.—GEN. SEC.]. In regard to poultry, Mr. Roper considered that no branch of the farm is so badly mismanaged on at least 75 per cent. of them. Birds of all breeds, ages, and relationships are promiscuously mixed up, their yard is everywhere—stackyard, stable, freshly-sown fields, and even the garden—wasting and spoiling more feed in a week than would keep them a month; and yet rarely are they fat, and are indifferent as layers. Is it surprising in such cases that fowls are unprofitable? To be successful the fowls must be well bred, of the right kinds; avoid in-and-in breeding, introduce new roosters at proper intervals; arrange the fowl yards on a well-considered system, to provide for separating the birds—the young and the non-layers from the laying hens, and, at times, for separating the roosters from the hens. Yards should be roomy, and furnished with suitable houses, nests, and feeding and water troughs. Two or three acres should be sown with grasses adapted to the locality, and divisible by movable hurdles or wire-net sections, so that the fowls can have a change from their yards. By dividing the paddock, one part can be manured and the grass stimulated whilst the other parts are being fed down by the fowls. [Here followed a table of probable expenditure on and possible receipts from 100 fowls for one year.—GEN. SEC.]. Pigs are found on most farms, but on only a few are they managed properly. Their styes are mostly an abomination to both pig and man, and the bacon made is hard, unsavory, and intensely salt. Local storekeepers may place such bacon on their counters, but it is almost ignored, whilst factory bacon from other places sells readily at 8d.

to 9d per pound. Pig-breeding is an important and lucrative industry, and selection of best breed, housing, feeding, breeding, and curing of the meat, will well repay the best attention. Styes should be well-built and intelligently constructed, so that they are constantly drained and kept dry and sweet; the back part roofed over; front facing away from the prevailing winds and cold points; floors sloping to side or front, with a drain at lowest point piercing the wall and carrying the drainage to a pit, from whence it can be carted to the manure pit. In order to get good prices for the hams and bacon, it is necessary to study and practice the best system of curing. That horse-breeding does not generally pay may perhaps be due to the indifferent horses bred, especially in hacks and carriage classes. Draughts are somewhat better, but "a good horse will always fetch its price." In conclusion, all farm products can be utilised to a greater or lesser extent. French military authorities say that "1lb. of straw chaff to 3lbs. of hay chaff can be used with advantage in feeding horses and cattle." Gather and stack plenty of straw for littering, and many tons of manure will be made in the yards, stables, and pig-styes. Profits on our products will be materially increased when the erection of butter, cheese, and bacon factories is warranted by increased production.

Stockport, May 14.

Present—Messrs. G. Burdon (Chairman), D. G. Stribling, C. W. Smith, S. Smith, J F. Godfee, T. Megaw, J. Smith, J. Smith, jun., G. Thomas, P. Hogan, T. Howard, S. Rogers, and J. Murray (Hon. Sec.).

TRIALS OF IMPLEMENTS.—Mr. S. Smith opened a discussion on this subject, and it was resolved to carry the idea into effect, a committee of five being appointed for that purpose.

Woodside, April 14.

Present—Messrs. R. Caldwell, M.P. (Chairman), W. Rabach, R. W. Kleinschmidt, N. Schroeder, J. W. Johnston, E. Esau, C. W. Fowler, and J. F. Lauterbach (Hon. Sec.).

CONFERENCE.—The Chairman reported having attended the Conference of Southern Branches at Strathalbyn, which was well attended. He had tabled there some excellent apples, and a pumpkin weighing 98lbs., which was admitted to be the largest yet seen. Seeds of this had been distributed by Central Bureau.

POTATOES—At a previous meeting Mr. W. Drogemuller reported on new varieties of seed potatoes received from Mr. F. Krichauff, Chairman of Central Bureau. Samples were tabled—Eyth yielding *at rate of* 4 tons per acre; Korn, 6 tons; Ehlers, 4 tons; Professor Merkür, 2 tons 3cwts.; Thiel, 5 tons; Wohltmann, 9 tons 2 cwts.; Gratia, 11 tons 2cwts. per acre.

Wilson, May 12.

Present—Messrs. W. H. Neal (in chair), R. Rowe, J. Coombs, J. H. Gill, T. Barnes, H. Need, A. Crossman, H. T. Crossman, and A. Canning (Hon. Sec.).

CROPS.—Most of the seed sown has failed to grow, and that which has sprouted is fast dying off, owing to the scanty rain that has fallen.

PIGS.—The Hon. Secretary read a paper by Mr. D. McNeil (Chairman), who was unable to attend. The following is an abstract:—

Many farmers do not avail themselves of all the opportunities to make the most of their land. Too much attention is given to wheat-growing, which is not too profitable when low prices and scanty yields prevail. With judicious management pigs ought to be made to pay the grocer's account and liquidate the rent of the farm. Mr. McNeil's idea was to enclose ten to fifteen acres with pig-proof fence, with posts 8ft. apart, seven or eight barb wires, with two droppers or lacings between the posts. This would be much stronger than pig-netting and not much dearer. Divide into three or four equal sized plots, arranged to supply abundance of water on each as required. Pens and shelter sheds should be put up, so as to be available from either of the plots. Some of the plots should be cultivated for green forage every year for the store pigs and brood sows; lucern is best if it can be grown. Cape barley and peas are excellent feed, and some might be left to ripen, when the pigs could be turned on to harvest it. All waste feed from the farm should be carefully stored convenient to the place where the pigs are to be fed. It is only in few years that something cannot be grown for pigs. If there is a spot where water can be turned on from a catchment area it may be possible to raise some beets, mangolds, or other root crops. Very green chaffed hay, steamed or soaked, or ensilage, with some bran or pollard, makes a good cheap feed for store pigs. To prevent gluts farmers should co-operate and start bacon factories at convenient centres on the railway lines Probably butter and cheese factories could be run in conjunction. Meantime they could readily establish places for slaughtering, dressing, and forwarding pork to the city or for export, as the freight for live pigs is too heavy on long distances to allow of any profit to the farmer.

Members agreed that green hay, steamed or soaked, makes excellent food for store pigs; but in most seasons there is great difficulty in providing green stuff in this district. [Ensilage will keep good in pits for two or three years if properly made, and is equal to fresh green feed.—GEN. SEC.]. One member said that pigs do well on saltbush. It is difficult to keep many pigs in this district on account of the scanty average rainfall.

OFFICERS.—Past officers were thanked, and Messrs. D. McNeil and W. H. Neal were elected Chairman and Vice-chairman, and Mr. A. Canning Hon. Sec.

Gumeracha, May 14.

Present—Messrs. D. Hanna (Chairman), S. Gent, A. Moore, V. S. Bond, A. E. Lee, J. Monfries, H. J. Kramer, J. C. Gall, W. Jameson, W. A. Lee, T. W. Martin (Hon. Sec.), and two visitors.

EXHIBIT.—Mr. Bond tabled samples of the fruit of Maclura aurantiaca (Osage orange), a useful tree for windbreaks, hedges, and, in some cases, for timber.

STOCK-RAISING.—Mr. S. Gent read a paper on this subject, dealing chiefly with practices followed in England. Mr. Hanna would have been pleased with more information in connection with the feeding of stock. Mr. Kramer said more attention should be paid in this colony to the housing of cattle during cold winter nights. Mr. Gall advocated spaying of inferior cows.

Lyrup, May 8.

Present—Messrs. A. Menzies (Chairman), T. R. Brown, T. Nolan, A. Weaver, A. Pomeroy, W. R. Lewis, and W. H. Wilson (Hon. Sec.).

EXHIBITS.—Mr. A. Pomeroy tabled two weeds which he believed to be poisonous. Forwarded to General Secretary. He also tabled samples of raisins made from Grand Centennial grapes, extraordinarily large. [Weeds were a species of Swainsonia and Lotus Behriana, both poisonous.—GEN. SEC.]

NOXIOUS WEEDS.—Very many seeds of various weeds are distributed over the land irrigated from the Murray. Most farmers take much trouble in destroying these weeds, but their horses carry seeds attached to the long hair about their fetlocks. It was thought that the hair should be cut short.

DAMAGE TO IMPLEMENTS.—Implements of cultivation, &c., are often much shaken in crossing the furrows made for irrigating. Mr. W. R. Lewis said he had seen land flooded, instead of distributing water in furrows, in order to avoid this damage.

Cherry Gardens, May 8.

Present—Messrs. F. Jacobs (Chairman), G. Hicks, J. Lewis, C. Lewis, E. Wright, A. Broadbent, G. Brumby, and C. Ricks (Hon. Sec.).

Crops.—The Hon. Secretary sowed rye and mustard in time for the early rain, and now he has a good crop from 18in. to 2ft. high. This feed does not impart flavor or odour to butter. The rainfall for April was 3·99in.

Sparrow Destruction.—It is considered to be a mistake to pay for gathered eggs supposed to be those of sparrows, because the eggs of some useful birds resemble them. It would be better to double the price for heads, and stop paying for eggs.

Non-attendance.—In future the name of any member failing to attend three consecutive meetings without sending a satisfactory excuse will be struck off the roll.

Mount Compass, May 15.

Present—Messrs. R. Peters (in chair), R. Cameron, F. Slater, W. Gowling, A. Sweetman, J. Hutton, C. S. Hancock, A. J. Hancock (Hon. Sec.), and three visitors.

Business.—The business transacted was mostly routine, but there were discussions on the blessings that would arise from better means of transit of produce to market, and upon federation and producers. Nominations were taken for officers for next session.

Crystal Brook, May 12.

Present—Messrs. G. Davidson (Chairman), W. Morrish, J. Symons, W. J. Venning, W. Hamlyn, R. Pavy, A. Hamlyn, W. Natt, and F. S. Keen (Hon. Sec.).

Standard Bushel of Wheat.—Members are of the opinion that the present system of buying wheat is not fair to the producer. If the standard of "fair average quality" is fixed at 63lbs per measured bushel, then a sample weighing 65lbs. per measured bushel should receive a higher price per reputed bushel of 60lbs than is paid for 60lbs. of a sample weighing only 63lbs per measured bushel, whilst a sample weighing only 61lbs. per measured bushel should receive proportionately less.

Criminal Destruction of Trees.—Mr. J. C. Symons read a paper entitled "Criminal Destruction of our Native Timber, and the Advantages of Tree-planting," as follows:—

The "criminal" destruction of native timber may seem perhaps a little strong to some, but to my mind "criminal" might be enlarged by "very" or "wickedly" criminal. It has been the practice with ordinary scrub farmers to cut, kill, and burn until there is not a tree left big enough to shelter a calf.

It is criminal to destroy native timber because of the serious results following. First, it is a protecting agent. Quoting from a valuable paper in the February number of our *Journal of Agriculture*—"When man, actuated by greed or ignorance, or a combination of the two, destroys the protection which nature spreads over portions of our globe, he turns loose agencies which soon pass beyond his control. The protecting agent is vegetation, and whether in the form of forests, brush, or forage plants and grasses, the balance between it and denuding forests is easily tipped, and then the inexorable law of gravity, unchecked by myriad blades of grass, by leaves, roots and vegetable moulds, gullies the hillside, strips the slopes, converts the rivulet into the torrent, and causes the steady flow of the river to become a devastating flood or a parched sand bed. When once this balance has been destroyed man cannot turn back the torrent and bid it flow once more a living and life-giving stream."

Again, desolation and poverty follow the destruction of timber. In all parts of the world this has been so. In Europe the deserts of southern France once maintained a well-to-do population. In 100 years, through the destruction of native timber, every particle of soil, which it took countless ages to accumulate, has been swept away. In Asia—the southern slope of the Caucasian Mountains—man has everywhere wrought ruin. Every stream, every slope, is marked with destruction. From the mountains down to the plains of Asia Minor is everywhere seamed with ruin, which the unrestrained hand of man has put in force. In America, in the Rocky Mountains, the work of devastation has gone on on a scale that dwarfs anything done in Europe. The axe of the lumberman, followed by the fires of the sheep-herder, have been active agents in converting vast areas into deserts as barren as the Great Sahara of Africa.

The most appalling feature is the absolute indifference with which most of the people regard the terrible results of the destruction of our native timbers.

Sand drift is another result of the destruction of our native timbers.

When I visited Port Augusta in 1878 I noticed that the sand had drifted in the main street on to the footpath and against the shop windows to a depth of several inches. I inquired if this had always been so, and my informant told me that the sand never drifted until after the townspeople had cut down the scrub, or native timber, and then kept a large number of goats, with the result that the sand was continually drifting, and several men, horses, and drays were employed in carting away the drifted sand. It must have cost the town a considerable sum annually to do this.

About twelve years ago, soon after the scrub land in Mundoora had been leased, I remember taking part in a discussion at Redhill as to whether the sand would not drift if the scrub were destroyed. It is now a matter of history that the sand has drifted, and that to an alarming extent. When driving to Mundoora some months since I noticed that the sand had drifted on the metal in places to a depth of 3ft.

I think I have shown clearly the serious consequences of the destruction of our native timber.

I want also to note some of the advantages of tree-planting. And on this I must acknowledge my indebtedness to the very worthy Chairman of the Central Bureau (Mr. Krichauff), who, in response to my request, sent me a paper he read before the Chamber of Manufactures in Adelaide many years since. First we should encourage tree-planting, because it will increase our rainfall.

Trees attract moisture and retain it; their roots retard too rapid drainage; their presence benefits springs; their shade checks evaporation; and we shall have heavier dew where trees are found. According to Sir Charles Todd's recent statement, our rainfall, though slowly, is surely diminishing. This is a most serious question for us all to consider. How shall we increase it? We answer most emphatically, "Plant trees."

In Austria, where cereals used to be profitably grown up to 2,000ft. above sea level, it is now found impossible to grow them through the destruction of the forests and the consequent diminished rainfall; the soil has become too dry, parched, and sterile, through exposure to the cutting winds. The inhabitants of the island of Mauritius are obliged to turn their most serious attention to tree-planting to arrest the evil effects of the destruction of their natural forests, and to increase the rainfall. In lower Egypt and in Algeria the extensive planting of trees by many millions has had a most marked effect upon the yearly rainfall. In Canada the rainfall is diminishing, attributed to the rapid destruction of their natural forests.

The former and present climate of St. Croix is a case in point. As long as trees were everywhere abundant on this island, rains were profuse and frequent. Twenty-five years later a portion of the island had become an utter desert. With the destruction of the trees the copious showers which frequently occurred in former times had ceased, and the process of desiccation gradually advanced. The sugarcanes failed, and desolation came slowly but irresistibly.

We should encourage tree-planting again, because of the necessity there is for timber for sleepers for our railways, for fences for our farms, and for firewood. Again quoting from Mr. Krichauff's paper—"For the year 1873 we imported into the colony £88,002 worth of coke and coals; for timber, £125,726. Admitting that the larger proportion of our present importation of timber consists of such kinds which we may probably have to import, even if we plant trees, it is yet noteworthy that we have not exported 1s. worth of our native timber against such large sums. It is, perhaps, an under estimate that from 800,000 to a million tons of firewood are consumed in this province annually."

Where is it to come from? What shall we do if we do not plant trees? The conservation and extension of our forests is of vital importance to the progress of man.

Another and the best reason why we should plant trees is that it increases the healthfulness and adds to the beauty of any district. In Italy, a large swampy district that was so unhealthy that it became depopulated, has been rendered habitable by the extensive planting of our Eucalyptus or Australian gum tree. For sanitary reasons, if we want to keep away the bubonic plague, let us plant gum trees. Then tree-planting makes our homes more attractive and beautiful. How neglected, wobegone, and unattractive a homestead is without any trees. On the other hand, when we approach a homestead surrounded by trees, we know, before we enter, that those who dwell there have an eye for the beautiful. With the increase of tree-planting, the number of birds will increase, which may delight us with their melodies, and they will aid us in the destruction of many injurious insects. The bee keeper will be more certain of his crop of honey, and our eyes will rest with pleasure on the improved aspect of the landscape.

One very hopeful sign for the future is that the people are waking up all over the world to the necessity of protecting the natural forests, and extending them by tree-planting. In the U.S. of America a Bill has been passed which provides that every future sale of Government land shall be with the condition that at least 10 per cent. of the timbered land shall be kept perpetually as woodland; and if the land is not timbered, the title is issued on the condition that 10 per cent. of the land is to be planted with forest trees within ten years, to be kept for ever as woodland.

Great attention is also being paid in East India to tree-planting. To a great extent the famines occurring periodically in India through absence of rain, are a consequence of the destruction of their natural forests.

RAISING FOREST TREES FROM SEED.—Mr. W. Natt read a paper, "Experience in Raising Trees from Seed, and Planting Out":—

The best time to plant ont young gums is during April and May, as the young trees then get a good start before the summer sets in. The ground should be thoroughly prepared the previous year. All farmers who have open land should plant a belt of gums, if only half an acre. The improvement to the farm is worth all the trouble, besides being a splendid shelter for stock in hot and in cold weather. It is not necessary to apply to the nursery for young trees, as any quantity of seed can be got from the trees after six years old by picking the green cones and drying them in the sun two or three days. The seed will then fall out, and by sowing them in boxes 2ft. square and about 6in. deep, with about 5in. of sandy soil, one could raise a thousand gums, and if these are transplanted in wet weather they will live without any dirt on the roots. The seed is better sown in January, as the young trees are then 4in. or 5in. high, and will stand the summer better. In spring grass should be cut and placed around the stems of the trees, as this helps to keep moisture in the ground, and prevents the trees scalding near the surface. This is the cause of a lot of trees dying in hot weather before they are big enough to shelter themselves. Bamboos are not good to plant trees in where white ants are bad, as when the bamboos begin to rot they attract the ants, and then they often eat the gums.

Members consider that all suitable vacant land along the railway lines should be planted with useful timber trees.

Hawker, May 9.

Present—Messrs. S. Irvine (Chairman), G. F. Bales, R Wardle, H. M. Borgas, C. W. Pumpa, J. W. Schuppan, C. E. Harry, T. Laidlaw, A. Clark (Cradock Branch), and J. Smith (Hon. Sec.).

PHOSPHORUS POISONING.—The Chairman said some of his cattle had been poisoned by eating phosphorised baits laid for rabbits. He wished to know if there is any antidote for phosphorus. [The only thing that might do any good would be liberal doses of carbonate of magnesia, but even this could do no good, except in very mild cases.—GEN. SEC.]

WEATHER AND CROP REPORTS.—Members consider that every branch should send in reports not later than 26th of each month, for publication in the *Journal of Agriculture*, to counteract erroneous reports current in the city. It had been stated that feed was coming on splendidly in this district, whereas there had been only enough rain to start herbage, and it was now perishing for want of moisture.

PICKLING SEED WHEAT.—Mr. Borgas had pickled seed wheat in a bag, left it in the bags for two weeks, found it malted, sowed it, and the crop was badly bunted. Mr. Hirsch always pickles in the bag, has allowed seed to remain five weeks, never found it malted, and thought Mr. Borgas's pickle was too weak. Seed wheat for pickling should be loose. He always used 2½galls. of pickle for each bag, with 4ozs. bluestone. Mr. Harry never pickles his seed, and never has a bunted crop, whilst his neighbor always pickles, and very nearly always reaps a bunted crop. Mr. Bales had tried pickling, and when he did he got much bunt. One year he pickled the seed for only one paddock, and that crop was bunted, whilst all the other crops were clean. The Chairman said one year he would have harvested 400 bags of wheat if he had pickled his seed, but instead he only got fifty bags. Bluestone, properly used, will prevent bunt or "stinking smut." The Hon. Secretary said he had had considerable experience with pickled and unpickled seed, and would strongly advise every farmer to pickle his seed. [If bluestone pickle fails to protect seed wheat from attacks by bunt the failure is undoubtedly due to some fault in the treatment. The efficacy of bluestone in preventing bunt has been proved experimentally and practically by so many thousands of farmers in all parts of the world that it is beyond all doubt a true protection against bunt or so-called "smut."—Gen. Sec.]

Kanmantoo, May 10.

Present—Messrs. T. Hair (Chairman), J. Downing, J. Mullins, J. T. Hair, W. G. Mills, and A. D. Hair. (Hon. Sec.).

Rainfall.—The Chairman produced a table showing the rainfall in this locality during the first four months of each year for the past twenty-six years, together with the total rainfall for each year. Referring to this table he concluded that, allowing for exceptions, when there is a rainfall of over 3in. for the first four months of any year the aggregate of that year is usually fairly good. In 1888 the low record of 1·31in. fell during the first four months, and the year's rainfall was only 11·64in. In 1889 the first four months gave 11·96in., and for the year 26·33in. When there is a deficient rainfall for a year or two it is followed by one or more good seasons. The rainfall for the last four years has been the lowest on the record:—1896, 13·46in.; 1897, 12·64in.: 1898, 16·73in.; and 1899, 13·04in. The maximum rainfall in twenty-six years was 26·33 in 1889; the minimum, 11·64, in 1888; and the average about 18in. The rainfall for the first four months of the present year has been 4·38in.; therefore, judging from the fact that the last four years have been the driest for twenty-six years and that the present year has opened so auspiciously, we have every reason for hope that a change for the better has set in, which should put new heart and life into farmers and graziers.

Pickling Seed Wheat.—Some members expressed the opinion that no pickling would prevent bunt if there were bunt amongst the seed; but Mr. Downing differed, and has agreed to pickle a bag of the worst-affected seed the aforesaid members can bring, and will prove that very little, if any, bunt will be found in the crop resulting from sowing that seed.

Eudunda, May 14.

Present—Messrs. C. Wainwright (in chair), H. D. Weil, A. Kluske, E. T. Kunoth, C. Pfeiffer, J. W. Krummel, J. A. Pfitzner, J. von Bertouch, and W. H. Marshall (Hon. Sec.).

Homestead Meeting.—This meeting took place at Mr. H. D. Weil's farm, where the members were most hospitably received. The host showed visitors over the place, and his flower garden was especially admired. A general discussion took place on "How to make farming pay," and the Hon. Secretary read a most eulogistic essay upon farm life and farm work, in which he depicted the charms of rural pursuits, and the advantages derived by all classes of the human family from the results of the farmers' work.

Mylor, May 19.

Present—Messrs W. H. Hughes (in chair), J. Nicholls, P. Probert, F. G. Wilson, T. Mundy, E. J. Oinn, E. Wilson, W. G. Clough (Hon. Sec.), and seven visitors.

BUSINESS.—With exception of apples tabled by three growers, the business transacted was of a formal nature, of no interest to others than those present.

Maitland, May 5.

Present—Messrs. H. R. Wundersitz (Chairman), C. F. G. Heinrich, J. Hill, James Smith, T. Bowman, J. W. Shannon, and J. S. McLeod.

WOOL-CLASSING.—An effort is to be made to form a wool-sorting class under superintendence of Mr. G. Jeffrey.

IMPACTION.—Mr. Heinrich stated that he had found that the liquor in which salt herrings has been boiled is efficacious in the early stages of impaction of the omasum in cattle. Two of the fish, boiled in a quart of water, will supply one dose. [Next, please !—GEN. SEC.]

Redhill, May 10.

PRESENT—Messrs. S. H. Treloar (Chairman), D. Steele, H. Darwin, D. Lithgow, W. Stone. F. C. Wake, R. B P. Bayly, R. H. Siviour, F. Wheaton, and J. N. Lithgow (Hon. Sec.).

AGRICULTURAL SCHOOLS.—Mr. Steele read a paper on Agricultural Schools and Education. He admitted that it would be of great benefit to the country if they could induce the young men to go on to the land instead of gravitating to the centres of population seeking employment as clerks and shop assistants. At the agricultural schools the boys might be taught some of the theory and science of farming; but without practical work on the farm they could not make farmers of them. What was the use of all they learnt at the school so long as they could not harness a horse, hold a plough, steer a reaping machine, or do any of the hundred and one things necessary. After lads leave school they should put in two or three years on a farm, and so learn the practical work of farming. Any boy brought up on a farm was always learning something about farming; he learns to milk the cows when quite young, and as he grows older and stronger he learns and does more work about the place, so that when he is 14 he can drive a team. It was not necessary to go to school to learn agriculture; let them be taught the three "R's" at school, and we farmers will do the rest. They had the Roseworthy College to teach the theory and practice of farming, but owing to the small area of land available the students could not get sufficient practical work, nor could enough stock be kept to teach students thoroughly on points connected with the breeding and management of sheep and cattle. Mr. Steele thought it would be better to spend money in enlarging the Roseworthy Farm than in teaching farming at the schools. Could they teach a boy to be a wheelwright or mason at school? No; they must send him to a practical tradesman; and so with farming. Members agreed in the main with Mr. Steele, but were of opinion that a little theoretical teaching would be beneficial to the boys, though admitting that practical work was more important. They also thought that two branch agricultural schools in connection with the Roseworthy College—one further North and one in the South-East—would be useful, as students could put in portion of their time on each, and so gain information as to the requirements of the different parts of the colony. Money spent in this way would, they thought, be of more benefit to the colony than if spent on a number of small schools. [Surely Mr. Steele is illogical in his arguments. Are not the proposed agricultural schools for the education of the sons of farmers mainly? He claims that the boys get all the practical work necessary on their parents' farms. How, then, can it but be advantageous if such lads are taught at school the main principles underlying cultural operations? The practical work of such schools would be simply directed to showing the why and the wherefore of the theories taught. It would still be neccessary to teach the boys at home *how* to do the work, and they will be none the worse for knowing *why* such work is done.—GEN. SEC.]

Redhill, April 19.

Present—Messrs. D. Lithgow (in chair), D. Steele, J. Pilkington, A. A. Robertson, R. H. Siviour, H. Darwin, J. N. Lithgow, and R. B. P. Bayly.

HON. SECRETARY.—Mr. J. N. Lithgow was appointed Hon. Secretary, *vice* Mr. T. McDonald, who has left the district.

NOXIOUS WEEDS.—Mr. Bayly resumed discussion on this subject; it was generally admitted that some amendment of the present Act was necessary. It was understood that the Local Government Bill would be re-introduced during the coming session of Parliament, containing clauses dealing with noxious weeds, repealing the Acts of 1862 and 1887, and simplifying the methods of procedure. One clause provided that the local boards must destroy weeds on land under their control, while another set out that notice published in the *Government Gazette* for two successive weeks, and in some newspapers circulating in the district calling upon landowners to destroy the weeds within thirty days, was sufficient notice to such landowners. It was also provided that if the owner failed to do the necessary work within thirty days the Board could put on men to do it at the expense of the owner. Members considered that the proposed amendments would be sufficient to enable the local authorities to compel landowners to destroy weeds growing on their lands.

STANDARD SAMPLE OF WHEAT.—Members were of opinion that wheat should be graded and sold according to quality.

Elbow Hill, May 9.

Present—Messrs. H. T. Styles (Chairman), E. Wake, C. L. DuBois, G. Dunn, W. N. Beinke, C. G. Ward, W. Ward, J. Rehn, J. Ellaway, and G. Wheeler (Hon. Sec.).

OFFICERS.—Messrs. Styles and Wheeler were thanked for past services and were re-elected.

CO-OPERATION.—Mr. Geo. Dunn read a paper upon this subject, to the following effect:—

This subject has often been discussed by the Bureau and the Press; but very little progress has been made. Every one agrees that co-operation is good; but until producers and consumers are brought into closer contact, no improvement can take place. Farmers have sold their wheat this year at 9s. per bag (4bush.), and had to buy some of it back in the shape of flour, pollard, and bran, at double that price. Outside the good that the Farmers' Union is doing, not much advantage can be gained by shipping wheat to England, as the profits are not so large as has been imagined, and there is a good deal of difficulty in the way. The Union might help members by erecting a mill and supplying flour at a lower profit than is exacted by millers. By purchasing in bulk a co-operation could supply its members with implements, fertilisers, tools, fencing wire, and numerous other requisites at a lower price than is at present paid. If it were made possible to borrow money at a low rate—under control of a local body—for construction of water reservoirs on private property, it would save many thousands of pounds per annum on labor in carting water, and in lost time.

Mr. Wake followed with a paper on the same subject, read at latest Congress. To follow out the ideas in these papers capital was wanted, and he suggested the establishment of a fund by regular subscriptions, and as money accumulates use it for co-operative purposes. He thought it could be worked in conjunction with the Bureau. [No, it could not; but the whole of the members of the Bureau might co-operate with others, and do excellent work outside the limits of the Bureau.—GEN. SEC.] Mr. DuBois said co-operation could be begun without capital. This was wanted most in selling produce and buying requirements, and a co-operative bank was not needed for that. By combining to purchase large quantities of manure, for instance, farmers in every district could save much money annually; so with bags and all other requisites. The Farmers' Union was a good co-operation, and the more it was made use of the less would be the proportionate cost of its working.

Boothby, May 15.

Present—Messrs. J. T. White (in chair), J. A. Foulds, T. Sims, M. Leonard, H. Robinson, T. Robinson, J. R. Way, G. T. Way, E. Bradley, R Chaplin, J. Bell, R Carn (Hon. Sec.), and one visitor.

FARM IMPLEMENTS.—Members think disc harrows would do better in this district if the discs were made stronger. Paring ploughs are preferred here for loose soils.

STANDARD SAMPLE OF WHEAT.—Members approve of the procedure of the Chamber of Commerce in procuring samples for the standard of fair average quality of each season's wheat crop.

Boothby, April 19.

Present—Messrs. J. T. White (in chair), T. Sims, H. G. Evans, J. Bell, R. Carn, J. A. Foulds, J. T. Way, and one visitor.

EXHIBIT.—The Chairman tabled eighteen varieties of wheat. Mr. Carn tabled excellent vegetable marrows, grown from Central Bureau seed. Mr. Bell exhibited Dart's Imperial wheat, which, he said, is the best he has ever grown; King Humbert tomato, very good; a watermelon weighing 18lbs. Mr. H. G. Evans said Japanese climbing cucumbers were excellent.

BUNT.—Mr H. G. Evans read a short paper on bunt in wheat. Mr. Carn wanted to know why self-sown crops grown alongside pickled crops had much less bunt. [There is just enough moisture in the soil to start the seeds (or spores) of bunt, and not enough to start the wheat grains. The bunt plant dies for want of a wheat plant to live upon, and the wheat starts to grow after the bunt is dead.—GEN. SEC.]

FEEDING LINSEED TO HORSES.—Mr. R. Carn read the following paper:—

The best way to give linseed to horses is to boil it with wheat, so that the strength of the linseed goes all through the wheat, and that is the easiest way to get the horses to eat the seed, until they get used to it, when they become very fond of it, and will eat it without the wheat. He had been using it for the last two years with a very telling effect. For cleansing horses from sand without purging, or sand colic, it is invaluable, as it causes the sand to come away without the horse showing any ill effects. The horse can be worked all the time, which cannot be done if resort is had to purgatives. Linseed is a strong and stimulating food, producing strength and pluck in the horse. By giving about half a pint to five horses twice or three times a week will keep them lively, and is quite enough. When starting to work and feed at seed time and harvest, if the horses have been running out, give a little more, say, half a pint daily, until the horses' coats become sleek and glossy and their eyes fiery; then give a little less, else the horse will begin to get saucy and try to be boss. Linseed may also be given raw, and a little stronger; but, as there is a lot of turnip weed and other seeds mixed with the linseed, it is advisable to boil it, to keep the land clean.

Brinkworth, May 10.

Present—Messrs. G. Freebairn (in chair), R. Cooper, Jas. Graham, A. W. Morrison, W. Welke, H. J. Welke, J. F. Everett, and J. Stott (Hon. Sec.).

Officers.—Messrs. S. Aunger, elected Chairman ; J. F. Everett, Vice-chairman; and J. Stott, re-elected Hon. Sec. Past officers thanked.

Annual Report.—Hon. Secretary read annual report. Twelve meetings held, with very good average attendance of members. Five papers had been read, and many practical subjects were discussed. Three homestead meetings had been holden, when members saw different methods of farming and appliances of a practical nature. Many varieties of seeds have been distributed to members, but, unfortunately, the returns were very poor, owing to the absence of rainfall during summer and autumn. Petatz Surprise wheat did well, and is likely to be of value. The *Journal of Agriculture and Industry* has proved to be of the greatest practical value, and every farmer in the colony is advised to subscribe for it.

Wilmington, May 14.

Present—Messrs. J. Hutchens (in chair), H. Noll, J. Schuppan, J. Zimmermann, W. Slee, R. Cole, J. Lauterbach, A. Paull, H. Harris, T. Carter, and R. G. S. Payne (Hon. Sec.).

Exhibits.—The Hon. Secretary tabled a good collection of seeds of wheats, barley, oats, and rye, received from Central Bureau. These were distributed amongst the members.

Ensilage.—Mr. J. Hutchens read the following paper:—

All stuff cut for ensilage should be full grown, but not dry. Many have made mistakes by cutting too soon, because the sap nearly all presses out if cut too green, and nothing is left but fibre. Whatever is cut for ensilage should be carted as soon as possible after being cut, especially if the weather is hot or dry. Cold, wet weather is the best for making good, sweet ensilage. It can be successfully made if it is so wet that the water runs out of the waggon. If the weather is hot, it is a good plan to throw a few buckets of water over each load as it is carted in. It is necessary, in stacking, to see that the herbage is evenly spread. If it is put in in lumps, the high places will take the weight and the low places will spoil. First-class ensilage can be made from herbage that will not make hay, such as Cape marigold, barley grass, clover, &c.; wild oats also will make good ensilage, and can be cut and carted whilst green, which is a good help towards cleaning the land. Ensilage will keep for any length of time, and there is no fear of its getting destroyed by fire. It is fit for use in about three months after stacking. The crop can be cut with the common mower, binder, or scythe. Sheaved stuff is very handy for carting and stacking. When using, it is better to take it off the top of the stack, and not cut with the hay knife. If cut, the air will penetrate the side and spoil a certain amount. Good ensilage can be made in stacks, but there is less waste if made in pits, especially if the pits are round or oval; there is always some waste in the corners of right-angled pits. Two pits, side by side, are very convenient, as the weights can be transferred from one pit to the other when refilling. A pit requires refilling about three times; weight, about 2cwt. to the square foot of surface is quite enough, and even 1½cwts. will do. Timber, stones, or anything heavy will answer for weights.

In answer to questions, Mr. Hutchens gave a deal of valuable information.

Nantawarra, May 14.

Present—Messrs. E. J. Herbert (Chairman), S. Sleep, C. Belling, Jas. Nicholls, A. L. Greenshields, R. Uppill, E. J. Pridham, A. F. Herbert, J. W. Dall, R. Nicholls, T. Dixon (Hon. Sec.), and two visitors.

Forest Trees.—Mr. R. Nicholls said the leaves of his two-year-old gum trees were stuck together, and the trees not growing. A member stated that the leaves were affected by an insect which rolled the leaves together when the trees are small and few in number. The best treatment was to go over them carefully and pinch the leaves together, and so destroy the insects.

PRICE OF WHEAT.—Mr. Pridham read a paper on this subject. The paper was well criticised by members, who considered the ideas unworkable. Mr. Dall urged on members the advantage arising from the contribution of short practical papers at their meetings.

MANURES.—Mr. Dall called attention to state of bags containing super, and felt sure that the farmers did not in many cases receive the full weight they purchased. In reply to question one or two members stated they had weighed their manure, and found some bags under and others over weight.

Bute, May 8.

Present—Messrs. W. H. Sharman (Chairman), S. Lamshed, A. Sharman, A. Schroeter, H. Schroeter, W. Hamdorf, and M. Hall (Hon. Sec.).

FIELD TRIALS.—Matters in connection with appointment of judges for forthcoming trial of implements under the auspices of the Bureau Field Trial Society were dealt with.

DRIFT SANDS.—A discussion on best means of stopping the drift of sandy land took place. Some members thought the drift could be stopped by sowing suitable hardy grasses.

Port Germein, May 14.

Present—Messrs. P. Hillam (Chairman), D. Thomson, W. Head, E. McHugh, E. G. Bleising, J. R. Gluyas, W. Broadbear, H. Kingcome, G. Stone. A H. Thomas (Hon. Sec.), and one visitor.

DAIRYING.—Arrangements for care and management of pure-bred Ayrshire bull loaned to the Branch by the Department of Agriculture were completed. Dairying is now carried on rather extensively in this district, and members hope that good will result from the introduction of a pure-bred bull.

WOOL-CLASSING.—It was decided to endeavour to arrange for a class on wool-classing to be formed in this district under the instruction of Mr. G. Jeffrey.

EXHIBITS.—Mr. Bleising tabled Rome Beauty apples, also a number of varieties of chrysanthemums.

Mount Pleasant, May 11.

Present—Messrs. G. Phillis (Chairman), W. M. Vigar, W. Lyddon, J. McConnell, F. Thomson, J. F. Miller, H. Dragomuller, and H. A. Giles.

CLEANING WHEAT.—Mr. Giles called attention to question by General Secretary in reply to his suggestion for the establishment of large plants at the outports. for cleaning and grading wheat. Mr. Giles did not consider that there would be any saving of labor or expense by cleaning the wheat on the farm more than is usually done, for the following reasons:—1. The day is far off when every farmer will possess a good cleaning machine. 2. Few farmers being able to do all their own work, consequently they have to employ hands; and it is difficult to obtain reliable experienced men to do the cleaning. 3. Bad, changing, windy weather is an insurmountable hindrance to efficient cleaning, which has generally to be done to keep pace with the strippers. 4. Quality of wheat varies on most farms. 5. The admixture of all the wheats delivered to shipping buyers would so blend the qualities that a uniform sample would result, to be at the same time graded in two sizes of grain as perfect as it is possible, while chaff and all other impurities would be removed, as a miller has to do before grinding, thus securing the most perfect sample possible. 6. The cleaning could be done as delivered, and the owner take back his inferior portion without loss of time or carriage, provided hours were fixed for working the cleaning machine. 7. Farmers could take back their own bags, and shippers fill the prime wheat into new branded bags of even weight and size by automatic appliance.

Mount Bryan East, May 12.

Present—Messrs. T. Wilks (Chairman), W. Bryce, E. Prior, A. Pohlner, W. Quinn, R. Webber, W. Dare (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—Members were of opinion that the standard sample of wheat was a fair average sample of grain, much damaged by the presence of bunt.

EXHIBIT.—Mr. Bryce showed watermelon of good quality grown from seed sown at end of December.

Penola, May 12.

Present—Messrs. E. A. Stoney (Chairman), L. W. Peake, E. McBain, D. McKay, W. Miller, J. A. Riddoch, J. W. Sandiford, Dr. Ockley, and R. Fowler (Hon. Sec.).

WOOL-CLASSING.—Decided to arrange for lecture on this subject by Mr. Jeffrey.

OFFICERS.—Messrs. E. A. Stoney, W. Miller, and R. Fowler were re-elected Chairman, Vice-chairman, and Hon. Secretary respectively for the ensuing year.

Yorketown, May 12.

Present—Messrs. J. Koth (Chairman), C. Domaschenz, T. Corlett, A. Jung, J. Latty, C. H. Davey, and J. Davey (Hon. Sec.).

MANGOLDS.—Mr. Corlett reported that he had been trying to grow mangolds on some land that used to carry good crops of wheat, but which for some years since had been quite bare of vegetation, owing to the rise of salt, soda, or magnesia, which dried on the surface as a white powder, devoid of any salty taste. Two years ago he sowed mangold seed on this patch, but the plants did not grow. Last year he raised the mangolds in a bed and transplanted them on the affected patch, and they had done splendidly, growing right through the summer. Some of them measure 6in. across the top.

Richman's Creek, May 15.

Present—Messrs. W. Freebairn (Chairman), J. J. Searle, A. Knauerhase, P. J. O'Donohue, M. Hender, F. Mattner, J. J. Gebert, W. J. Wright, E. Roberts, J. McSkimming, J. M. Kelly, A. Nicholson, J. MColl (Hon. Sec.), and one visitor.

WHEATS.—The Hon. Secretary called attention to favorable recommendation by Professor Shelton, of Queensland, of Budd's Early wheat, and it was decided to obtain a small quantity for trial.

Feeding Horses.—The Chairman found working horses do well on wheat chaff once or twice a day, mixed with a little pollard, and with a feed of good hay at night. The Hon. Secretary said their horses had kept in good condition through feeding on wheat chaff in morning, hay chaff at mid-day, and long hay at night, a little bran and pollard, with soaked wheat, being added to the short feeds. It was generally agreed that horses were the better for a change of diet, and that wheat chaff once or twice a day, with additions as above, was preferable to feeding with long hay alone.

Drilling-in Wheat.—It was stated that wheat drilled in in this district was coming up more evenly and making better growth than that broadcasted, this being specially the case where fertilisers were used.

Hay from Native Herbage.—Mr. Hender showed some hay in splendid condition, made nearly two years ago from native grass and herbage. Stock were very fond of it, and should the present season continue favorable to the growth of herbage he intended to cut all the grass he could and make it into hay for future use.

Angaston, April 31.

Present—Messrs. S. O. Smith (Chairman), R. Player, A. Sibley, R. Radford, W. Sibley, A. Salter, and E. S. Matthews (Hon. Sec.).

Visit to Seppeltsfield.—Mr. J. E. Swann sent up a graphic report of a visit by the Branch members to Seppeltsfield.

Standard Sample of Wheat.— Members considered the sealed bottle of "f.a.q." wheat sent by Chamber of Commerce to be a fair sample, but deferred to the judgment of Professor Lowrie and the Central Bureau.

Mount Gambier, May 12.

Present—Messrs. J. Watson (in chair), J. C. Ruwoldt, A. J. Wedd, D. Norman, sen., W. Barrows, T. H. Williams, J. Dyke, M. C. Wilson, J Umph rston, and E. Lewis (Hon Sec.).

Tuberculosis.—Mr. Stock Inspector Williams said many scientists had for a long time been of opinion that unless the udder of the cow was affected, the milk from tuberculous cows could be used with safety. In an article republished by *The Veterinarian*, from the *Zeitschrift fur Hygiene*, Drs. Rabinowitsch and Kemper refer to this matter, and show that this idea is incorrect. They have found bacilli in the milk in the very early stages of the disease, and without any udder infection, as well as in latent cases where the existence of the disease could only be verified by the tuberculin test. They point out that one examination of the milk is not sufficient, and cite an instance in which while the test of the cow gave a negative result, inoculating guinea pigs with butter made from the milk of the same cow on the day she was tested, resulted in the death of the guinea pigs; further examination of the milk at a later date revealed the presence of the tubercle bacilli. These authorities are of opinion that the milk of all cows that reach to the tuberculin test should be regarded with suspicion. Mr. Williams regarded this opinion as very important to all dairymen and owners of cows.

Tainted Water.—Mr. Williams said he had forwarded a sample of water from a waterhole at Glencoe to Adelaide for examination. The Chief Inspector of Stock had advised him that, on microscopical examination, the water was found to be teeming with bacteria, and must be extremely dangerous to all animals drinking of it.

Potatoes.—Mr. J. C. Ruwoldt exhibited samples of twelve sorts of potatoes, the original seed of which he received from the Chairman Central Bureau early in 1899. He planted them in the first week of February last year, but although he bestowed great care on them he only got a small crop, as he had already reported at a branch meeting. He planted the produce on September 4 last, and dug them in the first week of the present month. The detailed results were as follows:—

Silesia—¼lb. planted; crop 16lbs. Good bearer; close to the stalk. About 2lbs. small.

Ehlers—¼lb. planted; crop 17lbs. Same remarks about these as about Silesia; 1½lbs. small.

Thiel—1lb. planted; crop 50lbs. Real good potato; 5lbs. small.

Cygnea—2½lbs. planted; crop 80lbs. Fair cropper; 10lbs. small.

Korn—¾lb. planted; crop 40lbs. Very fair; 7lbs. small.

Eyth—⅓lb. planted; crop 23lbs. Fairly good; 3lbs. small.

Wohltman—1½lbs planted; crop 100lbs. Fairly good; 10lbs. small.

Pluto—¾lb. planted; crop 100lbs. No good; 30lbs. small. Grows too far from stalk.

Gratia—2lbs. planted; crop 45lbs. Remarks regarding Pluto apply to these, but Gratia grows closer to the stalk; 10lbs. small.

Hero—1lb. planted; crop 110lbs. First class; close to the stalk. About 10lbs. small. Best of all.

Professor Märker—¼lb. planted; crop 18lb. A real good potato; 1½lbs. small.

Angaston, May 12.

Present—Messrs. F. Salter (Chairman), F. Thorne, W. Sibley, R. Player, P. Radford. A. Salter, S. O. Smith, J. E. Swann, E. Thamm, J. Vaughan, E. S. Matthews (Hon. Sec.), and one visitor.

Seed Experiments.—The Hon. Secretary reported as follows on seeds received from Central Bureau:—Bush marrow, very fine sample tabled, sown September, cut May 1, weight 27lbs. 3oz.; White Milan turnip, fine sample tabled, sown December 23, pulled May 12, weight 3lbs. 1oz.. solid, splendid eating, small top; seed will be saved and distributed to members; McIvor Sugar melon, very fine, the best, sown September, exhibited at Angaston Show in February, awarded second prize; Sweet melon, "Melrose," very fine, sown September, exhibited at Angaston Show, first prize, no other variety being ripe so early, fine flavor and good appearance; Tomato seeds very inferior; Climbing cucumbers not a success; White Spine very good indeed.

Orroroo, May 11.

Present—Messrs. J. Moody (Chairman), W. S. Lillecrapp, R. Coulter, jun., E. Copley, M. Oppermann, W. H. Roberts, and T. H. P. Tapscott (Hon. Sec.).

Officers.—Mr. Lillecrapp was elected Chairman and Mr. Tapscott re-elected Hon. Secretary for ensuing year, a vote of thanks being accorded to the officers for past services.

Pickling Wheat.—Mr. Coulter was not convinced that bluestone was a preventive of bunt. He had seen bunted crops grown from seed pickled with bluestone, while on the other hand unpickled seed produced clean crops. Mr. Copley seldom pickled his wheat so long as the ground remained dry, but mostly pickled as soon as rain comes. Mr. Oppermann had found bluestone, properly used, a sure preventive. Mr. Moody read extract from article by Professor Lowrie on the subject of bunt and smut.

Harnessing Teams.—Discussion on best way to yoke team of six horses took place. Messrs Coulter, Copley, Roberts, and Oppermann considered that three and three was by far the handiest and most convenient to manage.

Watervale, May 14.

Present—Messrs. C. A. Sobels (Chairman), H. Beck, H. Scovell, S. Solly, G. Hunter, J. Thomas, B. Perrin, L. Buring, G. Holder, W. Smith, and E. Treloar (Hon. Sec.).

Apples.—Mr. Perrin tabled splendid sample of Rome Beauty apple; considered too large for export.

Deaths of Sheep.—The Hon. Secretary drew attention to losses of sheep in the district. Difference of opinion existed as to cause of loss, some attributing it to the sheep eating stinkwort while in flower, others to some poisonous weed, while others thought the loss of so many ewes when lambing was due to their being too fat. Members thought steps should be taken to get the inspector of stock to visit the district another year should the same trouble occur.

Pyap, May 18.

Present—Messrs. J. Bowes (Chairman), B. T. H. Cox, W. Axon, J. Harrington, T. Smith, E. Robinson, G. Napier, G. H. Mills, J. Napier, J. Holt, C. Billett, W. C. Rogers (Hon. Sec.), and one visitor.

Stock Disease.—The Chairman reported that the cow suspected to have been affected by tuberculosis had been destroyed, the lungs being found to be as "tissue paper," easily broken, and on exposure to the air crumbled under touch. The carcass had been burnt.

Exhibits.—Mr. Cox showed White Milan turnips from Bureau seeds, and distributed over 500 plants of new varieties of onion raised from seed received from Central Bureau. Some discussion took place on incubation of eggs.

Renmark, May 10.

Present—Messrs. W. H. Waters (in chair), R. Kelly, F. S. Wyllie, M. Chapman, C. Miller, S. R. Cox, H. Swiney, F. Cole, E. Taylor (Hon. Sec.), and one visitor.

Oranges Splitting.—Several members want to know why so many oranges burst open this season. [Owing to a sudden stimulus in growth, caused probably by heavy watering or rain, after a period of comparative drought.—Gen. Sec.]

Railway.—Mr. S. R. Cox read a paper strongly urging the necessity and expediency of railway facilities being provided between Morgan, Renmark and Wentworth.

Holder, May 13.

Present—Messrs. F. A. Grant (Chairman), F. G. Rogers, E. Jaeschke, J. E. Trimming, H. J. Rossiter, E. Crocker, J. Maddocks, J. J. Odgers (Hon. Sec.), and one visitor.

Annual Report.—The Hon. Secretary's annual report showed that during the year nine meetings had been held, the average attendance being 9·5. Only two papers have been read, and he hoped that the record for the coming year would be better. Messrs. F. A. Grant and J. J. Odgers were re-elected Chairman and Hon. Secretary for ensuing year.

Cattle Rearing.—Mr. Jaeschke read a paper on live stock which can be profitably kept by farmers. With the means possessed of growing fodder they should go in for dairy cows, which may be made exceedingly profitable. He thought the large breeds are best, and he preferred the Durhams (or "Shorthorns"), because if any of the herd are found unsuitable for the dairy they could always be sold at a good price. Natural food is always plentiful on the river bottoms. Sheep can be kept profitably if of the right sort, and they are protected against wild dogs by use of wire netting and barbed wires. Farmers' horses should be fed on chaffed hay in preference to long hay, as there is less waste of material and less loss of time in eating it. With cocky chaff (wheat husks) use some crushed wheat, to enable the horses to work better.

Forster, May 15.

Present—Messrs. A. Johns (Chairman), W. Johns, J. Johns, F. Johns, J. Sears, C. Bolt, J. A. E. Scheuscher, J. Retallack, and J. D. Prosser (Hon. Sec.).

EXPERIMENTS.—Mr. A. Johns said white-skin vegetable marrows reached 15lbs. to 20lbs. with him. Piemelons were fine, and useful for household as well as for feeding stock.

Gawler River, May 18.

Present—Messrs. A. M. Dawkins (Chairman), J. Hillier, J. Barrett, T. P. Parker, J. Drinkwater, and H. Roediger (Hon. Sec.).

FERTILISERS AT RAILWAY STATIONS.—Inconvenience having been experienced by some farmers residing at a distance from railway stations and post offices, owing to the short time allowed for unloading manures consigned to them, this Branch considers that the time allowed for unloading should be extended, or that the charge for demurrage should be reduced. This Branch requests that the matter should be considered by other Branches, with a view to securing this concession.

Dawson, May 5.

Present—Messrs. R. Renton (Chairman), P. J. Byrne, C. W. Dowden, A. J. Hooper, C. H. Meyer, D. Muller, A. H. Warner, A. F. Dempsey (Hon. Sec.), and one visitor.

HAILSTORM RELIEF FUND.—Audited account showed that 144 bags seed wheat and other goods had been distributed, and £1 13s. 5d. remained in hand. A vote of thanks was accorded the Hon. Secretary for his exertions in this matter.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

Riverton, May 9.

Present—Messrs. H. A. Davis (Chairman), J. Kelly, Thos. Gravestock, M. Nash, M. Badman, H. A. Hussey (Hon. Sec.), and three visitors.

STANDARD BUSHEL OF WHEAT.—After examining sealed sample, the following resolution was adopted:—"This Branch is of opinion that, if the sample shown is a fair average sample of the wheat produced throughout the whole of the colony, it is not a creditable one. The berries are fairly good, but the bulk is very badly cleaned. The Branch advises that, if farmers will not clean the wheat better, the standard should be raised, so that they will be compelled to do so."

Kadina, May 3.

Present—Messrs. T. M. Rendell (Chairman), T. H. Warren, H. Johnson, M. Quinn, D. Taylor, S. Roberts, and J. W. Taylor (Hon. Sec).

Rainfall, &c.—Arrangements to be made for supply of monthly notes upon rainfall, condition of crops, health, &c., of live stock, and similar information, for publication in the *Journal of Agriculture.*

Feed for Livestock.—Mr. Johnson said that he was badly off for feed for his stock two years ago. Since then he had been most careful to save plenty of wheat chaff and straw, and his stock were doing well. On cold bleak nights the cattle sought shelter by the straw stack, and ate the straw with apparent enjoyment. Mr. Roberts said his stock prefer green feed.

Locally-made Superphosphate.—The Hon. Sec. stated that he had conversed with Mr. T. C. Cloud, manager of the Wallaroo Smelting Works, who told him that the plant now being established would produce only about 100 tons weekly at the start, and about 1,300 tons for the whole season, so that farmers could not depend altogether upon local manufacture. [Scarcely, in view of the fact that the quantity mentioned is less than 10 per cent. of the quantity of mineral super. imported during past five months —Gen. Sec.]

Bluestone.—The Hon. Sec. said Mr. Cloud informed him that the bluestone made at Wallaroo Smelting Works is superior to much that is imported, and the Governments of New South Wales, Queensland, Western Australia, and South Australia were using Wallaroo bluestone. The Government of Victoria also wished to be supplied, but the works at present cannot produce sufficient to comply with the request. A stronger certificate of the quality of the Wallaroo bluestone than is furnished by the above facts could not be required. Several members testified to the efficacy of bluestone pickle for prevention of bunt. Mr. Quinn said farmers should not sow ' smutty " wheat.

Clare, May 18.

Present—Messrs J. Christison (Chairman), W. Kelly, H. Carter, Geo. Scott, W. Kimber, W. S Birks, J. T. Hague, and H. J. Yelland (Hon. Sec.).

Officers.—Mr. Kelly was elected Chairman and Mr. Yelland re-elected Hon. Secretary for ensuing year. The Hon. Secretary's annual report showed that the attendance during the past year had been very poor, showing that as a body the members took insufficient interest in the work of the Bureau.

Pests.—The habits of several insect and fungus pests were discussed. those affecting the pear receiving most attention. "Dieback" of apple trees was reported to be less prevalent than last year.

Johnsburg, May 12.

Present—Messrs. F. W. Hombsch (Chairman), H. Napper, W. McRitchie, G. H. Dunn, J. Sparks, L. Chalmers, T. A. Thomas, T. Johnson (Hon. Sec.), and three visitors.

Exhibits.—By Mr. W. McRitchie—Some very fine potatoes, grown by himself on trenched ground; planted in January, covered with straw and loose earth, and watered three times during growth. The tubers were beautifully clean. Also several packets of "Long Yellow" carrot seed, for distribution. The original seeds came from the Central Bureau, and it is an excellent variety for this locality.

HOW TO MITIGATE THE EXTREMES OF OUR CLIMATIC CONDITIONS.—Mr. Buchanan, a visitor, read the following paper :—

I propose to show what really influences the weather, and thus try to promote discussion. The climate of any country is governed by well-known laws, which I might state briefly :—1. Distance from the equator, that great belt of the earth on which the pressure of the air is always low. 2. Distance from the seaboard. 3. Height above sea level. 4. The physical shape of the continent. 5. Prevailing winds. Now I have the following:—The excessive heat and cold of any place may be modified, on the following statement made by Professor W. L. Jackson, of the California University, who says : "The value of California's forestry is greater than the value of all her gold mines, and her orchards, and all her vineyards. The wise conservation of forests means water for agriculture and protection against drought. We cannot shift our particular locality nearer the sea, neither can we raise the level of our land several hundred feet, nor cause a large range of mountains to rise up in our midst to intercept the winds, and compel them to give up their moisture." A striking illustration of the value of mountain ranges in the play of the elements being the Andes of South America, which intercept all that moisture which is left in the winds that blow against them from the east. When those winds reach the western sides of the mountains they are perfectly moistureless ; therefore, if it can be shown that the conservation of forests, and the planting of new forests will do for us what the Professor above states is being done by the Californian forests for California, I think we would do well to go in largely for tree culture. History records in hundreds of cases where the denudation of forests has disastrously affected the climate, and that the re-afforestation of some of the places has brought again the previous prosperous conditions. Here is a striking illustration of the results which follow wholesale destruction of forestry. "In the year 1826 we are told that Bokhara—the khanate of Bucharia—was one of the most fruitful and fertile regions of Central Asia. It was heavily timbered and well watered, interspersed by rivulets, canals, and reservoirs. The inhabitants started cutting down all the great forests, and by the year 1876 very few trees were left, those which the people spared being destroyed by fire during the civil war. The consequences were not long in following, the place being now an arid desert. The watercourses have dried up, the irrigating channels are empty, and the sands of the desert, being no longer restrained by the belts of forests, are rapidly encroaching upon the land, which will ultimately transfer it into a desert as desolate as that which divides it from Khiva." On the Continent, owing to the destruction of forests, streams which were navigable by river steamers will now hardly float a boat. Cases of the disastrous results which follow the wholesale destruction of trees may be quoted from Sweden, Denmark, Mauritius, and the Azores. Germany, England, France, Greece, Spain, &c., have all suffered from the effects which follow the destruction of forests, some more so than others. On the other hand, extensive tree-planting (the Eucalyptus variety) on the malarial swamps of Italy has made what was once a fever-infested locality a prosperous and highly populated district. Likewise the delta of the Nile, which was once an arid desert, has, through the establishment of forests, been made one of the most fruitful localities in the world. Before the Khedive of Egypt caused these millions of eucalyptus trees to be planted on this delta, the average number of rainy days there per year was six ; since the establishment of these forests, the average number of rainy days per year is forty. In France, Napoleon III. caused millions of trees to be planted, with beneficial results ; also in Algeria the extensive planting of trees has resulted satisfactorily. I need not quote more instances, but I should just like to say, that, in our own colony, a few miles from Yankalilla, on the road to Victor Harbor, there is a valley which in great part consists of swampy land heavily timbered. I have heard Mr. O'Leary express his opinion that if that valley were denuded of its trees, it would be one of the most unhealthy places of that part. As it stands now, people live in its very centre without feeling the ill effects of the marshy air. Now take the value of belts of trees as wind breaks. I need not say very much about this, but would just like to quote the opinion of those experts who visited the early settlers of the Murray. The land required for tilling purposes, which is all heavily wooded, was cleared by them right back from the water's edge, only a few majestic pines being left standing. The soil being sandy, drifted, as the wind had play over, say, 1,000 acres or more. The opinion was expressed that strips, say three chains of the forests, should have been left on the watersheds, or elsewhere suitable, running parallel with other, to break the force of the prevailing winds. I think this is now being done by some of the settlers with very appreciable beneficial results. Looking again at the part trees play in the health of the community, we all know that they, in common with other vegetation, absorb or inhale through the pores of their leaves, the carbonic acid gas of the air, which is poisonous to animal life, and that they exhale, or give forth, oxygen, which human beings inhale. Vegetation has a peculiar effect on the atmosphere. In densely-wooded tracts the temperature is neither so hot nor yet so cold as in similar tracts which are treeless. The reason is not far to seek. Vegetation retains a normal temperature, 45° F. to 50° F. Trees cast off their perspiration through the spiricles, or pores of the leaves, just as a great proportion of the waste matter of our bodies is cast out through the pores of the skin. Exact observation relative to this transpiring show that an average-sized tree will cast off as much as 40 galls. of water per day. Fancy now a large forest consisting of a few hundred square miles—say somewhere in our own vicinity—at the above rate per tree the amount of vapor which would be added to that already prevalent in the air. The condensation of this vapor, which is caused through the warm moist watery air rising (it being lighter than the dry cooler air), which flows in to take its place, and as it rises from the surface it would be condensed into copious rains. The sap of the trees contains solids and water. Now the solids only are used in building up the frame of the tree; the water is given off into the air. Then notice again the temperature of the leaves—45° F. to 50° F. Take the following illustration to show what is meant:—In a warm room where a good fire has been burning all day, and a number of people have been gathered together, the air might be thought to be tolerably dry. Bring a tumbler of cold water into the room, and mark what happens. You will see the *outside* of the glass immediately covered with a fine film of mist. In a little while minute drops of water will form out of this film and continue growing until perhaps some of them will unite and fall to the ground as drops of rain. The meeting of the two extreme temperatures has caused the formation of the mist, and latterly, rain. Now from this we infer that if winds, say at a temperature of 112°F. sweep over a large tract of forest, the meeting of the two temperatures, 112°F. and 45°F, will do in a modified way what was done to the sides of the tumbler in the above illustration. The hot air, which is always moist, will be made to give up some of its moisture, which will condense upon the colder trees, and thus the excessive heat of the winds, ere they leave the belt of forest land, will be considerably modified Trees beautify the landscape, as well as supply shade to animals, besides having so many utilitarian uses, that I have not time to produce them here. Geologically, we are told that the roots of trees play an important part in the breaking up and formation of our soil. The rootlets strike through in all directions until the soil becomes more and more broken, until it passes insensibly into an uppermost dark layer of vegetable soil or humus. Now the percolating moisture which falls from the trees sinks through this humus and forms springs and underground channels of water, from which our river system is supplied. Geologists maintain that South Australia at one time possessed monstrous forests teeming with abundant insect and other animal life, over which hung an area of low pressure with a considerable rainfall where now is an arid desert, similar to the bed of a dried-up ocean over which a high pressure area exists. No one knows what has brought about this change. That these forests, &c., did exist has been proved by the remains of monstrous animals and birds which are indigenous to heavily-wooded and well-watered conditions. Our air here is too dry; there is a great radiation of heat, because our plains are too low, consequently there is always, or nearly so, an area of high pressure to be pushed out of the way whenever a low pressure area approaches our coast. To modify this evil everyone should encourage tree-planting in localities which would be thereby benefited. Take our colony: The population all told is something like 360,000. If we were to plant, say, one-third of this number of trees yearly—say 120,000—and one-half of them were to grow on the average, that would mean 60,000 trees annually—say 100 trees to the acre—this would mean 6,000 annually added to our forests. I think the results would be the same in our case as in Algeria, Egypt, &c. The kinds of trees, method of planting, &c., I have not dealt with owing to limited time at my disposal. In conclusion, Sir William Crooks says that more oxygen will have to be generated, and electricity will solve the problem "More oxygen, more rain."

Inkerman, May 15.

Present—Messrs. D. Fraser (Chairman), J. Sampson, G. Peter, W. Board, C. H. Daniel, W. Fraser, J. Lomman, W. A. Hewett (Hon. Sec.), and two visitors.

Water Supply.—The Chairman initiated a discussion on this subject. The want of permanent water was a very serious matter to farmers in these localities. If farming was to be made profitable, grazing must be combined with cultivation. A good stamp of breeding ewes would, he thought, be generally admitted to be the most profitable stock for small farms, but it was no use going to the trouble and expense of selecting a good lot unless their water supply was assured. With a dry season they often had to sell all spare stock for what they would fetch, as it will not pay to cart water for them. Water-carting involved a large amount of wear and tear on the wagons, besides expense and loss of time. Then the feed required for use at seeding time is consumed, and the horse stock run down, as nothing pulls them about more than water carting. The consequence is that they commence seeding leg-weary and incapable of doing their work as it should be done. He believed the cost of water carting for one summer would pay water rates for several years if they could get the water laid on at reasonable cost, and the rates would not be a burden. Mr. Sampson agreed that the want of water was a great drawback, and proposed that, if water could be obtained through the Bundaleer scheme at 2d. per acre rates, this Branch approves of same, and is satisfied that it will be of great benefit to the district. Mr. Board said it now cost the local council something like £100 per annum to keep the different wells and dams in repair, and with a proper water scheme this amount would be available for much needed work in other directions. Mr. Fraser said the price per 1,000gals. at which water could be supplied was the great point. Mr. Daniel said he had put down twelve bores, but got nothing but salt water. He strongly supported the resolution, which was carried unanimously.

Forest Range, May 10.

Present—Messrs. J. Vickers (Chairman), A. Green, J. Sharpe, R. E. Townsend, and H. Waters (Acting Hon. Sec.).

BEST PEARS.—Mr. Townsend read a paper entitled "The Best Sorts of Pears to Grow" These included Citron des Carmes and Jargonelle, which must be marketed directly they are ripe, else they will decay at the core. William's Bon Chretien [Wrongly described as "Duchesse d'Angoulême" here, and as "Bartlett" in America.—GEN. SEC.] is the leading summer pear for the Adelaide market, and may be kept for a month if picked carefully. The best autumn pears, he thought, are Gansell's Bergamot, Butter Pear (?), Flemish Beauty, Marie Louise [Seldom bears a crop.—GEN. SEC.], Beurre Clairgeau, and Pitmaston Duchess For winter, Vicar of Winkfield [Wrongly called "Napoleon."—GEN. SEC.], Josephine de Malines, L'Inconnue, Winter Nelis, Keiffer's Hybrid, and Glou Morceau (also called "Winter Duchess") are the best. The foregoing are all dessert varieties. Uvedale's St. Germains and Swan Egg are the best keepers of the cooking varieties. Mr. Townsend tabled seven varieties of pears. [He mentioned "Bell Pear," "Butter Pear," "Hardyman," and some others which are apparently merely local names.—GEN. SEC.]

Port Pirie, May 12.

Present—Messrs. P. J. Spain (Chairman), W. Smith, J. Lawrie, T. Johns, G. Hannan, W. Wood, G. M. Wright, R. F. Humphris, W. K. Mallyon, R. J. Ferry (Hon. Sec.), and Geo. Stone (Port Germein Branch).

WOOLCLASSING.—The names of over twenty persons desirous of joining the proposed woolsorting class under tuition of Mr. G. Jeffrey were handed in.

LINSEED OIL FOR STOCK.—Mr. Lawrie drew attention to recommendation by Mr. Wardle, of Naracoorte Branch, to give boiled linseed oil to stock suffering from impaction. Mr. Lawrie considered this a mistake; raw linseed oil should be used.

RAINFALL.—Mr. Hannan tabled report on rainfall for 1899 and 1900 to date, as recorded at his farm. The rainfall for 1899 was 8·88in.; 2·28in. falling during the first quarter, 3·56in. the second, 1·79in. the third, and 1·26in. the final quarter. During the first three months of 1900 2·35in. fell, and since then 2·3in. had been recorded.

STEAM THRESHING PLANT.—By invitation Mr. Stone attended and gave an interesting account of the operations of the Port Germein steam threshing plant.

In reply to questions, Mr. Stone said the cost of a threshing plant would be about £700. He would not recommend this Branch going to such expense, but would suggest that farmers should cut a large portion of their crop and have it treated by the Baroota thresher. It could thresh about fifteen bags of wheat per hour under favorable circumstances. He had never been docked by wheatbuyers for wheat cleaned by the thresher, but, on the contrary, had received ½d. per bushel more, because it produced a nice sample and did not crack the grain. The cost of threshing was 3d. per bushel up to 100 bags, and 3½d. per bushel for any less quantity, and if a larger quantity could be obtained to treat every season it could be done for 2d. per bushel. All the farmers who had employed the services of the thresher have expressed themselves wholly satisfied with its work. Mr. Lawrie could quite indorse Mr. Stone's remarks, having had considerable experience in threshing in the early days of the colony, and urgently advised farmers to cut the better part of their crops with the binder and have it threshed by the Baroota Threshing Company. Mr. Smith said those farmers who threshed their crops gained a great advantage over those who did not in several respects, the chief being the accumulation of vast stacks of straw, which makes nourishing fodder for stock, and a guard against shortage of feed in the time of drought. If every farmer had his corn threshed there would not be such a number of starving cattle. There was not so much grain wasted by the thresher as by the stripper. Mr. Wright considered the header preferable to the thresher for small quantities. Mr. Humphris did not agree with Mr. Wright, and affirmed that stock would not eat straw which had been treated by the header like they did the threshed straw.

Finniss, May 7.

Present—Messrs. T, Collett (Chairman), S. Eagle, A. E. Henley, W. W. Heath, S. Collett (Hon. Sec.), and one visitor.

Sheep.—Members discussed this subject, and concluded that every farmer who has sufficient land should keep at least sufficient sheep to supply his family with meat.

Mundoora, May 11.

Present—Messrs. R. Harris (Chairman), J. Blake, W. Aitchison, D. Owens, J. Shearer, J. J. Vanstone, T. Watt, C. Button, H. Haines, and A. E. Gardiner (Hon. Sec.).

Testing Samples of Wheat.—In discussing this subject, Mr. Harris considered wheat-buyers' agents should use some better and more satisfactory method in testing samples of wheat. The present system of testing by scales is not satisfactory. Farmers in each centre could combine to purchase an Imperial ¼bush. measure, or if the price were not high, many farmers could purchase one for own use. Mr. Aitchison had seen them used in Scotland, but they had also a hopper to fill them correctly. Members all agreed with the idea, and inquiries will be made with regard to cost, &c., of the necessary measures of capacity.

Bunt.—Mr. Vanstone would like to know whether it is possible to ascertain if crops are affected with bunt, say, at the present time. [If the plant will ever be affected by bunt, it is present within the tissues of that plant now, in the form of mycellium. The leaves of the wheat-plant may probably be of a darker green than usual and somewhat "crinkled," but these appearances may be due to other causes.—Gen. Sec.]

Change of Seed.—Members consider that a change of seed is beneficial. Mr. Aitchison said in Scotland farmers found advantage in getting seed from England. Mr. Harris benefited when he obtained seed from Kangaroo Island or from Mount Gambier. New Zealand wheat gave better results generally on the second year of sowing.

Sore Shoulders.—Mr. Haines had proved that a mixture of eucalyptus oil and lard is useful to apply to sore shoulders on horses.

Golden Grove, May 22.

Present—Messrs. T. G. McPharlin (Chairman), S. A. Milne, J. R. Smart, F. Buder, W. Mountstephen, H. P. Day, John Ross, J. Woodhead, and A. Harper (Hon. Sec.).

Homestead Meeting.—Members met by invitation, and were most hospitably entertained, at Mr. R. Smith's, Surrey Farm, comprising about 600 acres of the best land for farming in South Australia, upon which crops of hay up to 2 or 3 tons per acre are often cut, as the result of good tillage and liberal manuring. Many other crops are also raised, such as fruit, onions, potatoes, and green fodder. The stables, byres, sheds, and numerous other erections are well and substantially built. The chaff mill, chaff loft, bagging and loading departments are capable of dealing with 60 to 70 tons of sheaved hay at one time. The bone-crushing plant was in full work, and was a centre of interest. The machinery is worked by a 12½ h.p. Hornsby oil engine, and the sample produced is very fine and, of course, pure. In the orchard apricot trees predominate. Being rather old last year several of them were cut back very severely with a view to securing a lot of young growth and increasing the fruit production. At a distance of half a mile Mr. Smith has another 12 acres of six-year-old trees, the yield from which will probably be about £12 10s. per acre, and next to this are about 10 acres of Mataro vines, which bear heavily. On this account Mr. Smith estimates that they are as profitable as those varieties which carry a higher price but bear lesser crops. After refreshments a conversational meeting was held, and Mr. Smith exhibited some phenomenal selected ears of wheat, large heads of dhurra, and other varieties of sorghums, and various seeds. Thanks were accorded to Messrs. Smith.

Lipson, May 12.

Present—Messrs. S. F. Potter (Chairman), Geo. Provis, Jas. Brown, Chas. Provis, E. Thorpe, J. McCallum, H. Brougham, E. J. Barraud (Hon. Sec.), and one visitor.

Guano.—Inspector of Fertilisers wrote that the sample of guano sold locally only contained 17·9 per cent. tricalcic phosphate.

Cultivation of the Soil.—The question of treatment of drills during seeding time took place, members being unanimous that the drill required more than ordinary care. Chairman read paper from *Journal of Agriculture* on burning stubble *versus* ploughing it in. The Hon. Secretary said it was well known that a good strong fire over the land seemed to make it wonderfully fertile for a year or two. He thought the action of the fire rendered the plant food in the ground available to the plants, but would like to know whether this was so. Fallowing and ploughing of stubble land was discussed. Members strongly favored fallowing, even if it necessitated a lesser area being put under crop. Mr. Brown wished to know class of land most suitable for oats.

WORMS IN PIGS.—Mr. Provis asked for treatment recommended for worms in pigs. [In aggravated cases give a dessertspoonful of turps in about half a pint of linseed oil, afterwards give half dram each sulphur and sulphate of iron in a pint of linseed tea. For mild attacks or for young pigs give sulphate of iron in the food two or three times.—GEN. SEC.]

OFFICERS.—Mr. Geo. Provis was elected Chairman, Mr. J. Brown Vice-chairman, and Mr. E. J. Barraud re-elected Hon. Secretary for ensuing year.

STANDARD SAMPLE OF WHEAT.—At previous meeting standard sample of wheat from Chamber of Commerce was carefully examined, and the opinion expressed that, if two grades were fixed, the sample tabled would do well for a second-class grade.

Bakara, May 10.

Present—Messrs. R. Barrow (in chair), J. Roy, W. G. Wilson, J. E. Dietrich J. E. A. Siedel, and one visitor.

OFFICERS.—Messrs. R. Barrow and F. E. H. Martens were elected Chairman and Hon. Secretary for ensuing year.

AGRICULTURAL IMPLEMENTS.—Discussion took place on this subject. Smith's three-furrow and four-furrow ploughs were favored. The larger ploughs were, however, considered too heavy. Damp-weather strippers without spur gear were considered best. Binder and header method of harvesting not considered suitable for this locality. The header cleaning-machine did not find favor with members. Mr. Dietrich said all implements should be painted once a year, to preserve them.

Clarendon, May 21.

Present—Messrs. J. Spencer (Chairman), J. Wright, R. Hilton, W. Spencer, J. Chapman, E. Dummill, and A. L. Morphett (Hon. Sec.).

EXHIBITS.—A large number of varieties of apples was tabled. After discussion it was decided that the best sorts to grow in this district are Cleopatra, Rome Beauty, London Pippin, and Strawberry Pippin.

GUARANTEE WITH FRUIT TREES.—Members decided to club their orders for fruit trees this season and place it with one nurseryman, who will be requested to give a guarantee that the trees are all true to name given.

Koolunga, May 10.

Present—T. B. Butcher (Chairman), J. Button, R. Lawry, J. Sandow, J. Freeman, J. Butterfield, R. H. Buchanan, J. Jones, J. Pengilly, G. Pennyfield (Hon. Sec.), and one visitor.

HORSE-BREEDING.—Mr. Buchanan urged that farmers should pay more attention to the breeding of the stamp of horses required for army remounts in India and South Africa. Such horses were scarce and commanded good prices. Mr. J. Freeman was of opinion that the thoroughbred of the present day was too small; he believed in mating a good upstanding thoroughbred to a good mare. He advocated the purchase of a suitable stallion by farmers of the district, limiting the number of mares to be served each season; he had had very little success from travelling stallions. Mr. Pengilly did not think the farmers had the stamp of mares that would produce suitable horses for India, and even if they had, he doubted if it would pay to breed them. Service of good stallion would cost £3, the foal had to be reared, and at five years might fetch £13 to £18, the prices now offering.. Messrs. Jones and Sandow thought what farmers most wanted were good draughts, which were scarce; they wanted horses that would help them to get a living off the farm. Mr. Butcher believed in breeding draught from draughts, and crossing medium draught mares with a thoroughbred horse. He thought it would pay farmers if they could raise good carriage horses.

Swan Reach, May 12.

Present—Messrs. J. T. Baker (Chairman), P. Hasse, B. Swarz, E. Miche, W. White, T. Fidge, D. Raw, W. Hecker (Hon. Sec.), and one visitor.

Officers.—Past officers were thanked, Mr. J. T. Baker re-elected Chairman, Mr. P. Hasse Vice-chairman, and Mr. W. Hecker elected Hon. Secretary.

Rabbits.—The various methods of dealing with the rabbit pest were discussed, but no ultimate decision arrived at as to which is the cheapest and most effective plan.

Port Broughton, May 14.

Present—Messrs. G. E. Pattingale (in chair), S. M. Bawden, R. Stow, B. Excell, A. H. Dolling, E. Dalby, J. Harford, H. Whittle, and Jas. Barclay (Hon. Sec.).

Horse Feed.—Members desire to know the relative value of bran and pollard compared with wheat meal as food for horses. [Bran and pollard mixed and given in moderation along with hay would give as good results as would be derived from feeding small quantities of crushed wheat with full rations of hay. The question as to which of the two is the more economical must be governed by circumstances. If the farmer owns a crusher it would pay him better to give crushed grain than to buy bran and pollard.—Gen. Sec.]

Exhibits.—Mr. Pattingale tabled a nice sample of headed wheat. Mr. Barclay exhibited specimens of wool, including Bradford tops, noil, &c.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— June 1, 1900.

Dry weather set in with the late month, and a severe succession of frosts occurring in the central and northern plains did great havoc with the young feed and wheat plants, so that in those districts the position at the moment is very discouraging, though it has somewhat improved during the last week through a setting-in of moister weather conditions. In other parts of the colony, especially in the hills and south-eastern plains, a splendid winter for feed has put stock in excellent condition for the high-priced markets that have held up during this season, although in sheep and cattle there are now signs of return to more moderate rates For stockowners generally the outlook is not dispiriting, wool showing an inclination to recover the drop in values that took place since last shearing.

Commercial houses report a fair quantity of business passing, in spite of the low price of our chief cereal and the unfavorable state of some parts of the country. Steady development continues in copper mining, and the late reported gold discovery at Tarcoola, in what is practically a new country—for this metal at least—is causing attention to be directed to the unexplored portion of our colony towards the Western Australian border.

"Stagnation in the breadstuffs market" about figures up the conditions prevailing over most wheat export countries during the month of May. The harvest prospects are favorable in most of the producing centres in the Northern Hemisphere, and this prevents speculation, as it is also certain that a fair surplus will be carried over. In some places, such as California, where freights have been almost unobtainable, and they are beginning already to reap splendid crops, it must lead to an increased desire on the part of a good many of their producers to quit at least a portion of their holdings. Latest reports from South Africa are to the effect that stocks of produce there are still heavy, and will be kept up by cargoes afloat and previously arranged for. In Sydney the trade is lifeless, whilst Melbourne has nothing cheering to say, the only new business they report being the sale of a 1,500-ton parcel of breadstuffs to India. Western Australia is doing only a hand-to-mouth trade, and locally there is an entire absence of activity, whilst quotations are a shade lower. In fodder the month has also been quiet. Sydney again getting into a position to quote millers' offal forced shippers here to lower their prices for bran and pollard. Feeding grains nominally unchanged, but chaff is offering more freely, as many farmers, having finished seeding operations, can now resume carting.

Trade in potatoes has been continued during the past month mostly to South-Eastern samples, but there is a growing desire amongst buyers in favor of imported sorts, so that these are now beginning to be offered; values remain unchanged. Heavy stocks of onions are held at Mount Gambier, and as the season is none too favorable for keeping them in dry condition, holders are very ready to do business at quotations.

A full month's trade was done in the lines classed as dairy products. For a couple of weeks local supplies of butter were sufficient for home requirements, but the heavy frosts, by cutting off feed in many directions, caused such shrinkage in the production of milk that a resumption of importations again became imperative, so that we are still dependent on our neighbors for a portion of our requirements. The welcome change to moister weather conditions during past week should soon restore the colony to a self-supplying state, though it is hardly likely, now the cold weather is on, that we can have any surplus for a couple of months, even if the weather should prove exceptionally favorable. A very satisfactory month's trade in eggs has been put through, our chief customer, West Australia, taking all we had to offer at high rates. The season's average price shows up well, giving the record for several years past, but we may soon expect the seasonable easing back in value. A fair amount of business doing in cheese, but as new-made samples are beginning to reach market the upward trend in price has been checked, though the value of good matured must well sustain, stocks of these being unusually light. Bacon further advanced and has been very saleable, hams also finding ready buyers. For honey there has been more active demand at improving rates; beeswax scarce. Considerable quantities of almonds quitted.

Full catalogues of carcass pork and veal have sold at prices satisfactory to buyers, the comparatively high rates ruling for live fat stock causing keener competition. In poultry, turkeys have ruled somewhat low in price, but all other sorts have been realising well.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, 2s. 7½d. to 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 5s. to £6 7s. 6d.; country, £5 12s. 6d. to £5 17s. 6d. per ton of 2,000lbs.

Bran.—9½d. to 10d.; pollard, 11d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 4d. to 2s. 6d.; prime Gambier milling, 3s.; ordinary stout feeding, 2s. 7d. to 2s. 8d. per bushel of 50lbs.

Barley.—Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. 4d. per bushel of 50lbs.

Chaff.—£3 10s. to £3 15s. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Prime locals, to £3; Gambiers, £2 14s. to £2 16s.; Tasmanian, prime redskins, £3 7s. 6d. to £3 12s. 6d. per 2,240lbs.

Onions.—Locals, up to £3 10s. per 2,240lbs.; Mount Gambier, £3 to £3 5s.

Butter.—Creamery and factory prints, 1s. 1d. to 1s. 3d.; dairy and collectors', 11d. to 1s. per pound.

Cheese.—S.A. factory, choice, 7½d. to 8½d.; ordinary matured to good new 6d. to 7d. per pound.

Bacon.—Factory-cured sides, 7½d. to 8d.; nice farm lots, 6½d. to 7½d. per pound.

Hams.—S.A. factory, 7¼d. to 8½d. per pound.

Eggs.—Loose, 1s. 5d.; in casks, f.o.b., 1s. 6½d. per dozen.

Lard.—In bladders, 5d.; tins, 4½d. per pound.

Honey.—2¾d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 3¾d. to 4d.; Brandis up to 4½d.; kernels, 8½d. per pound.

Gum.—Best clear wattle, 1½d. per pound.

Dressed poultry.—Turkeys, 6d. to 7d.; fowls, 5¼d. to 6d.

Carcass meat.—Bright shop porkers, 5d. to 5½d. per pound; good baconers to fair porkers, 4d. to 4¾d.; heavy weights and medium stuff, 3½d. to 4d.; vealers 1¾d. to 2¼d. per pound.

Live poultry.—Fine table roosters, each 1s. 5d. to 1s. 8d.; good hens and medium cockerels, 10d. to 1s. 2d; light and poor birds, 8d. to 10d; ducks, very saleable, 1s. 11d. to 2s. 7d.; geese, 3s. 6d. to 4s.; pigeons, 4½d.; turkeys, 3½d. to 4d. for ordinary birds; fine table sorts, 4½d. to 5d. per pound live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Factories and Workshops Bill, 1900.

The Factories and Workshops Bill (England), which has been introduced by the Home Secretary, proposes several alterations in the present law, of which the most important are as follows:—

Regulations for Dangerous Trades.—The Bill proposes to substitute for the present method of establishing special rules in dangerous or unhealthy trades by means of arbitration, a new procedure.

Under the existing law, rules are established separately for each factory and workshop, with the result that diverse rules may be in force in the same industry, and even in factories where the circumstances are exactly similar. Every occupier has a separate appeal to arbitration against any new rules, and hence, by the proposal of special rules for any industry, the Home Office may find itself involved in a separate arbitration with each occupier. In the arbitration one of the arbitrators is appointed by the person or persons interested, and the appointment of umpire is subject to his consent. On the other hand, the present procedure allows the occupiers a public hearing of their objections after the rules have been definitely formulated.

In place of this procedure, the Bill provides for the establishment of general regulations for the whole of a defined class of factories and workshops, with, if necessary, defined exceptions.

While preserving the right of the occupiers to object, and to have their objections heard judicially in open court, it gives the Secretary of State the power of appointing the referee by whom the objections would be heard. The referee will be an independent person, selected by the Secretary of State, in no way concerned either with the Factory Department which proposes the rules, or with the trade which objects to them.

This referee will hear all persons entitled to the proposed regulations, and will then give a general decision applicable to the whole trade.

The power of making rules is, at the same time, extended to meet the case of the tenement workshops where, under the existing law, no one can be made responsible for not enforcing the rules; and it is also made clear that the rules can prohibit the use of any particular material; and can modify statutory rules if they stand in the way of more effective precautions.

Sanitation.—The existing provision with regard to the prohibition of home work in places injurious to health, can only be put in force if both the following conditions are satisfied: – (1) There is danger to the health of the persons employed; and (2), there is danger to the general health of the district. The Bill proposes to abolish the necessity for the fulfilment of the second of these conditions, which has hitherto rendered the provision in the Act of 1895 inoperative.

Safety.—(*a*) Children are prohibited from cleaning under moving machinery if it is possible for them to come into contact with the machinery: (*b*) Steam boilers are required to be provided with proper safety valves and gauges, to be cleaned and examined internally by a competent person once in three months; and to be examined internally and externally by a competent engineer once in six months: (*c*) The provisions respecting means of escape from fire are strengthened.

Employment.—The age at which children may first be employed in a factory or workshop is raised from 11 to 12, thus making the law for Scotland and Ireland the same as that in England.

In certain occupations of a special character it is proposed to allow the employment of women in two shifts under stringent restrictions.

Additional regulations are made with regard to the employment of persons in a factory or workshop and a shop on the same day.

Laundries.—With the view of simplifying the law, it is proposed to repeal the present provisions relating to laundries, and to empower the Secretary of State by an order to apply to laundries, with or without modification, such of the provisions of the Factory Acts as are applicable. The existing exemptions are retained.

Particulars.—Power is given to the Secretary of State to extend the provisions of the "Particulars" section to outworkers.

Emergency Processes.—The existing unlimited exemptions for certain processes, *e g.*, jam-preserving and fish-curing, are repealed, and the Bill, while providing exemptions for emergency processes, *i.e.*, processes which must be immediately carried out to save perishable materials from spoiling, confines the exemptions strictly to such processes, and limits them to a relaxation of the restrictions in the relation to the hours of work prescribed by the Acts.

Other provisions of the Bill empower the Secretary of State to determine by order what accidents shall be reported to the factory inspectors and certifying surgeons, and to require reports of particular classes of accidents, whether injury is caused to any person or not.

The definition of "non-textile factory" and "workshop" are extended to include places, other than laundries, where articles are cleaned.—*Labor Gazette.*

Ventilation of Factories and Workrooms.

By Inspector Bannigan.

The proper ventilation of factories and workrooms, and, in fact, all inhabited buildings, is a matter that rarely ever receives the amount of attention it deserves, and is, as a rule, treated as an abstract consideration. It would be well to have it clearly understood that living in an impure atmosphere must sooner or later have an injurious effect on the human system, and may often be the starting point from which disease is contracted that subjects many to severe sufferings in later life.

In the hurry and bustle of the early settlement of this colony it is only too apparent that buildings were constructed with a view to the necessary space only, and questions of comfort and such small matters as ventilation were completely lost sight of. Many of these buildings are of a most substantial character, and monuments of architectural skill, but an examination of their interior too often reveals the fact that not a single opening to assist ventilation exists beyond the doors and windows, and perhaps a fireplace, for the inlet and outlet of air.

Personally I attach the very greatest importance to openings in the highest practicable point in a room for the outlet of respired or exhausted air. Pure cool air, which is of course heavier than warm vitiated air, will find its way into the room through innumerable chinks and porous parts of the walls, to replace the lighter expanded air, so that if the outlet openings are ample, and properly situated, the inlet for fresh air will generally be fully provided for by doors and windows. The expanded air in escaping may be said to carry off with it most of the impure vapours and organic particles thrown off by respiration, &c., except perhaps in exceptional cases when the fumes or gases are heavier than the outside air, when they will, of course, collect and form the lower strata, until sufficiently diluted with air to be carried off.

Carbonic acid, when unmixed with air, is much heavier than pure air, and when in this state any living creature that may wander into the space containing it will be asphyxiated. A very good illustration is afforded by a brewer's fermenting tun, the upper portion of which during the process of fermentation contains little or no air. The space not occupied by liquids and other solids is charged with carbonic acid, on which the air over the vat rests. The surface of the acid may be clearly observed by forcing a puff of smoke over the vat, which will reveal a heaving surface not otherwise observable, and very much resembling the swell of the ocean in its movement. A vessel thrust into this apparently empty space can be brought out full of carbonic acid if the mouth of the vessel is kept uppermost, and anyone wishing to try the effect on his lungs may do so by inhaling a little, and will not be anxious for a second dose.

It is not intended in this article to go into the scientific question of how carbonic acid is produced, &c., but it may be useful to say that the amount produced by respiration of one adult is equal to a little over 4 per cent. of the air respired. A healthy average-sized adult, when at rest, breathes at the rate of seventeen respirations per minute, and at each respiration about 30·5 cubic inches of air pass in and out of the lungs.

The quantity of carbonic acid which is given off by an adult, as calculated from the above figures, will be about 0·72 cubic feet per hour, and this amount is said to be increased threefold by persons engaged at hard work. Other sources from which carbonic acid spring are heating of stoves which are unprovided with flues leading to the outer air, and ordinary gas burners. One cubic foot of coal gas produces, when burnt, two cubic feet of carbonic acid, together with traces of sulphurous acid. Hence, if the cubic space or ventilation is deficient, the contained air becomes more speedily devitalized by the deprivation of its oxygen, while the impurities of respiration are supplemented by those of combustion. Carbonic oxide may also be given off by iron stoves, and this gas is so poisonous that 1 per cent. in the air may cause asphyxia.

The average composition of pure atmospheric air per cent., by volume, is said to be as follows:—Oxygen, 20·96; nitrogen, 79·00; carbonic acid, ·04; with traces of ozone, mineral salts, and organic matters, and a variable amount of ammonia and watery vapor.

The relative specific gravity of pure air at 32° F. and carbonic acid are:—

Atmospheric air, at 1·000.—Weight of one cubic foot .... ·0807
Carbonic acid, 1·527.—Weight of one cubic foot .... ·1232

It is calculated by various authorities on this subject that if the carbonic acid in the contained air of a room exceeds 0·8 per 1,000 volumes, injurious effects to the occupants may result.

So much for carbonic acid, which, I am afraid, has led me a little off the track of my subject.

Fireplaces in rooms are excellent for assisting ventilation, but they are, in my opinion, too much relied on as vents by which the air may be changed. Indeed the fireplace, and chimney connected therewith, may to a certain extent carry off the pure air that ought to remain for respiration, and leave the devitalised expanded air forming a huge column in the upper portions of the room.

I need hardly repeat the importance of remembering that pure air is as a rule heavy, and remains nearest the floor, while the respired air, which has become expanded by warmth, makes upwards. and, if not allowed to escape, cools and descends to the lower plane, to be again breathed by the occupants, and so on. The fireplace being on a level with the floor, and as a rule rarely exceeding 3ft. in height, the entrance to its outlet may be considered to be always within the pure air space, and it follows that any suction created in the chimney will draw off a large proportion of the purest air.

Now a few words respecting the best methods that may be adopted to secure proper ventilation. Most rooms have at least one outer wall in which, as close to the ceiling as possible, a number of air-bricks should be inserted, having sufficient unimpeded through air space to provide 12 sq. in. for each person in the room. These air-bricks should, if possible, be distributed all round the room, and no single outlet space should contain more than 24 sq. in. in order to avoid unpleasant draughts.

Ceiling ventilators are still more valuable, and may be partly concealed by artistic designs in plaster, and when connected with a tube leading through the roof and crowned by a vacuum—or what is more generally known as an OB—top, the outlet considerations are as near perfect as can be desired. Care should always be taken, however, not to make the openings too large, or so situated as to create draughts. The object should always be to allow the used-up air to escape, and to be gently and imperceptibly replaced by purer air.

The object of the globe-shaped top and cover it may be explained is to create an upward suction in the tube. This is caused by the action of the wind, which impinges on the upper quarter of the globe, and is then directed towards the cap, passing with concentrated force over the opening, and partly creating a vacuum in the globe, which in turn is replenished from below. In large buildings, where numbers of persons are employed, inlets for fresh air should also be provided. The air should be admitted through apertures in the outside of the wall about a foot above the surface, and carried upwards through a cavity in the wall or air flue, and admitted to the room through perforated zinc, at a height of about 7ft. from the floor, From here it will gently descend into the room and avoid cold draughts playing about the feet, too often felt in places where the openings are near the floor.

In cases where the room is so situated that neither inlet nor outlet for air can be secured owing to the proximity of surrounding buildings, a fair amount of ventilation may be obtained by means of a box-shaped tube of zinc or galvanized iron carried from the nearest outer wall right through the building under the ceiling and having openings at either end communicating with the outer air. In the portion within the room to be ventilated a number of small holes are made, and a diaphragm is placed in the centre of the tube to prevent the air blowing right through. According to the direction of the wind one half of the tube becomes an inlet for fresh air, which falls gently into the room through the perforated zinc, while the other half becomes an outlet for vitiated air.

In all workrooms a cubic space equal to not less than 400ft. for each person should be provided.

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AND

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NOTES AND COMMENTS.

June opened dry and cold, and severe frosts were experienced over a large area of country. Up to the middle of the month prospects were not too encouraging, more particularly in the drier areas. As will be seen from the weather and crop reports, the latter half of the month proved very favorable. Showery weather was experienced over the whole of the agricultural areas, and good soaking rains fell. It is particularly gratifying to note the rainfall records for the month in the districts which have suffered most, from 1½in. to 2½in. having fallen. As the fall was mostly of a steady nature, the rain has soaked well into the soil and will carry on the crops and feed all right for a time, and, with favorable weather during the next three months, we may look for a good harvest. Some optimistic authorities are already estimating the harvest, forgetting, apparently, the lesson taught by past experience that September most frequently makes or mars the harvest. A good supply of feed is assured in most districts, and the dairying industry will benefit accordingly. Lambing should also take place under favorable circumstances as far as the farming districts are concerned.

The good rains experienced during the latter half of June will allow of fallowing being pushed on rapidly. It has been frequently asserted by Professor Lowrie that early fallowing is worth 2in. of rain to the wheat crop at its most critical stage, and the experience of the past few years strongly supports this opinion. The earlier the land is broken up to admit to the lower layers of soil the winter rains the better. One very pleasing feature in connection with agricultural operations in this colony is the large increase in the area of early fallow of late years, and there can be no doubt whatever that the more general adoption of this practice and the use of commercial fertilisers will result in largely increasing our average returns from wheat. Farmers must not overlook the fact that the use of fertilisers, unless combined with careful cultivation, will not pay. The fertilisers will not take the place of good cultivation, as some from their action appear to expect.

The United States Department of Agriculture has been carrying out some tests to ascertain the effect upon the germination of seeds of the application of various chemical fertilisers, and though the results up to the present are not regarded as conclusive, they are instructive to users of fertilisers. Potash and nitrogen, in the form of nitrates, had a most disastrous effect upon the germination of wheat, radish, lettuce, and clover seeds, either when placed in contact with the seeds or mixed in the soil. Phosphoric acid and lime, if not used in excess, are harmless. The chief injury appears to result from the effect of the fertilisers upon the young sprouts after they leave the seed coat, and before they emerge from the soil. The effect of the potash and nitrate upon the germination of wheat is worthy of special note, and it would be interesting if our farmers who have drilled either of these fertilisers with wheat would take special notice of the effect of same on the germination of the seed. If the results referred to are substantiated in further tests it will be necessary to apply these fertilisers some time before the crop is sown.

Last season the Horticultural Instructor received from the manufacturer several sample tins of an insecticide, called by the appropriate name of "Kilemquick." This is a preparation of tobacco, extracted under steam pressure, and is very strong. It simply requires to be mixed with eighty to 100 parts of water, when it is ready for use. Several growers, besides officers of the Agricultural Department, tried this preparation for destroying peach aphis, and all reported most favorably, and the Department was asked to endeavor to induce the manufacturer to place it on the local market. At the request of Mr. Quinn, Messrs. E. & W. Hackett, of Adelaide, have obtained the agency in South Australia for the preparation, and those troubled with peach aphis would do well to give it a trial, as it is considerably cheaper than the grower can make the tobacco decoction from tobacco waste.

At the Roseworthy Agricultural College and farm there is a continuous hay and straw baling press, which is admitted to be the best and cheapest in work that has ever been invented. It would be well for members of Branches of the Agricultural Bureau to see this at work, and then to combine and purchase one. Thousands of tons of straw ought to be baled every year. The bales could be used to build sheds, barns, shelters, long protection walls for gardens, and other useful works; and, when drought occurs, and when there is no herbage or other fodder for farm live stock, the walls of sheds, barns, shelters, etc., can be broken up and used to keep the animals alive, if not in good fat condition.

All kinds of live stock have been killed from time to time through getting too close to wire fences during thunder storms. These accidents could easily have been prevented by fixing short lengths of wire to the wires of the fences at distances of say 50yds. apart, and letting the lower end into the soil a foot deep.

It has been stated that, where horses are partly fed upon potatoes, they are never troubled with bots. Now that the bot fly has become introduced into South Australia, this hint may be of use. But kerosening the parts that can be reached by the horse's mouth, and regular brushing and currycombing will be still more beneficial.

The catalogue of trees for distribution, issued by the Forest Department, shows that this season 403,194 trees are available. Last season 1,465 persons applied for and obtained 268,668 trees. During the eighteen years past that trees have been distributed from the Forest Department nurseries, 4,850,801 trees have been given away. In too many cases recipients do not treat their trees fairly, apparently thinking that they have done enough if they break up the ground and stick in the trees. A timely article by the Conservator of Forests should be carefully studied by all intending to plant trees this season. The catalogue, which contains particulars of trees available, instructions for planting, and other useful information, can be obtained by anyone sending a stamp for postage to the Conservator of Forests, Adelaide.

Forest trees can be made to live almost anywhere in South Australia, but if trees are wanted to *grow* and make timber they must be planted on good soil, in a suitable locality. Some trees will do well upon plains not much elevated above sea level, but cannot thrive in hilly country, whilst there are many kinds of trees that will thrive in the cool and hilly districts, but would not live on the hot plains of the lower levels. Very little immediate profit can be realised from forest trees, as they cannot be sold till they are cut down; but much benefit and gratification will accrue from the presence of trees in any locality. They protect crops and animals against cold, heat, rain, and wind; they ameliorate the extremes of climatic changes, promote rainfall, and in a hundred ways contribute to the health and comfort of man and beast.

Farmers in several districts are not acting fairly to themselves or to the creameries or dairy factories established in their neighborhood. They not only do not try to maintain a regular supply of milk throughout the whole year to their factory, but they even act suicidally in sending their milk to rival factories that may be established by "pirates," or send to distant factories, because the temptation of a slight advance has been made (temporarily) by the rival firm or firms. These people fail to recognise that it costs just as much to work upon 500galls. or less of milk per day as it does to run 2,000galls., and that, therefore, the profits divisible amongst them from a 2,000galls. daily supply would far more than compensate for the extra price offered by the rival firms. There is a factory south-east from Adelaide which cost £2,000 to equip, but which now gets only 50galls. of milk per day, and yet another factory is about starting only a mile distant from it. What hope can there be of success where such stupid practices are adopted—where farmers desert their own factory, founded with their own money, to favor a rival in whom they have no interest, except the prospect of a ½d. per gallon (temporarily) for their milk.

A first-class mixture for curing bacon consists of 7lbs. fine salt, 4ozs. saltpetre, and 2lbs. brown moist sugar, well mixed. This is sufficient for 100lbs. meat, and should be well rubbed into the meat on both sides, using a strong leather glove on the hand. If wanted with an added flavor, mix 1oz. each of ground ginger, allspice, and cinnamon. This pickle should not be all used at once, but rubbed in at intervals of seven days for three weeks, piling the sides on each other, and changing top for bottom every three or four days.

With regard to the great damage by foxes killing lambs, Mr. J. Wyatt, in the *West Wimmera Mail*, writes:—"It occurred to me to try the use of bells on the ewes, having used bells previously against dingoes for the same purpose very successfully. This I found answered admirably, not losing a lamb afterwards by foxes, and I have continued using bells on the ewes ever since with the same result. The bell is a No. 5 Kentucky bell. The small, round, tinkling sheep bell is of no use for this purpose. Not less than 3 per cent. of bells should be put on, and in scrubby or hilly country 5 per cent. of bells. A good deal depends upon class of country, class and condition of ewes. I have proved the use of bells for this purpose frequently, and never found it to fail; and my neighbors were not long in adopting the plan, and continue to do so Foxes are very easily poisoned in many ways, and not difficult to get at."

Verjuice, or "varjus," as the English yokels call it, is cider vinegar; and, when pure, is about the best and most wholesome of vinegars. During the processes of fermentation and filtering it becomes clear and free from all impurities. Any apples will do for cider vinegar, and now that the inspectors are authorised to grant permits for removal of fruit from infected orchards, under especially strict supervision, it is made possible to utilise the fallen fruit for this purpose. There will be much less temptation to evade the regulations by foisting "wormy" fruit upon unwary customers, and the value of sound fruit will thus be enhanced. There has been a proposal to establish a factory near Adelaide for making cider vinegar, but no commencement has been made as yet.

Rent or interest on capital expended on land, buildings, implements, &c., and live stock of a farm are items which must be calculated in accounts for each year. Depreciation is another item, and labor must also be calculated. All these items must be dealt with annually, and profit looked for—but often not found—after the debtor and creditor sides have been balanced. Deficiency is often apparent, but the reasons for that deficiency are not readily detected. "Too much attempted, too little preparation and care devoted to the work," may often be ascribed as the cause of failure. "A little farm well tilled keeps the purse always filled" is more often true with respect to the small farmer than in regard to the man who has a large area and small capital. Where weeds prevail crops surely fail: manure the ground and crops abound. It will well repay any farmer to visit prosperous farms, and learn the habits and customs of the men who own them.

FURZE, GORSE, OR WHIN AS FODDER.—Furze (Ulex europæus) is a very valuable fodder plant, but its strong spiny leaves are so protective that live stock seldom touch it except when the plant is young and tender. It is usual in some parts of the United Kingdom of Great Britain to run the gorse or furze through rollers to crush the spines. In New Zealand the whin (or furze, or gorse) is grown in rows 6ft. to 8ft. apart, and sheep are used to keep it down to moderate height. These rows serve as shelters for the sheep as well as for keeping them in good condition. When the plants get too old they are burned, and fresh plantations started. The following table shows the respective nutritive values of several plants:—

Foods.	Flesh-forming Matter.	Fat-forming Matter.
Furze	3·21	9·38
Cabbage	1·63	5·00
Kohlrabi	2·75	8·62
Mangel	1·54	8·60
Swedes	1·94	5·53
Carrots	0·60	10·18
Turnips	1·80	4·43

BRIEF NOTES ON TREE-PLANTING.

By Walter Gill, F.L.S., F.R.H S., Conservator of Forests.

As the time for planting forest trees has now fully arrived, a few comments on the subject will probably prove helpful, and with this end I intend briefly to refer to the most important points requiring attention.

The first consideration is the preservation of the plants from exposure before they reach their final destination and are planted out. Carelessness here is a fruitful source of failure with *all* trees. Only lately I saw some fruit trees lying in a wagon with their roots quite destitute of any covering whatever, and hanging over the side, subject all the time to the chafing against the wagon itself induced by the motion inseparable from travelling slow or fast, and with the roots getting drier and more shrivelled all the time. A little damp straw or grass placed round them and covered by a small piece of bagging tied with a little string would have saved all this risk; and no planter who values his trees and wishes to secure a good result in each case can afford to neglect the simple precautions necessary. Evergreens also, such as pines, are frequently allowed to rest against rough cases or other unequal surfaces in such a way as to sadly bruise and often quite break off much of the young shoot growth which is still tender and only partly matured. Wherever friction takes place either with tender shoots or with bark of harder stems or branches mischief is done, and a check is given to the tree which it takes a longer or shorter time to recover from.

All time taken in carefully packing sufficiently moistened soil round tender roots of young trees of any kind just lifted from the nursery bed is time well spent, which will be amply repaid later on; and the tops should receive necessary shelter in transit from heavy winds as well as from the sudden increase of heat that is sometimes experienced even in winter time in this colony.

Even gums grown in bamboo tubes, which can be carried with far greater facility than others, and with absolutely the minimum amount of root exposure, should be placed upright in an empty case, previously filled with an inch or two of soil, into which they must be well bedded, and thus entirely protected from the drying influence of the air. Cases have come to my knowledge where these bamboo plants have been thrown anyhow into the back part of an express wagon and suffered to roll backward and forward with the motion of the trap during a fairly long journey in the drier parts of the colony. The consequence has been the fine soil in the tubes has lost its moisture, and shaken loose either from part or from all the little tree's roots, which have then become so dry as to lose most of their vitality, with the ultimate result that very few of them succeeded. Is it any wonder that failure followed such glaring neglect? Did the so-called planter merit aught else?

If open-root plants cannot be planted out directly they are obtained they should be carefully opened out and placed in line, with ample soil over their roots and well sheltered from all wind and sun. Just a little water may be given to keep them fairly moist, but not enough to force fresh growth should they remain unplanted longer than was originally anticipated.

The preparation of the soil for the trees will, it is probable, have already been attended to in many instances, but if not should at once be started. There is no doubt whatever that where circumstances admit of land being either trenched by hand or subsoiled or trench-ploughed by teams the extra rapid and vigorous growth induced in consequence of this special attention is well worth the labor bestowed. In cases, however, where this cannot be done a thorough ploughing for 6in. will give a good start to any trees carefully planted on land so treated if the soil be subsequently well spaded for their reception and the under-soil, below a spade depth, well broken with pick or bar, if at all compact in character. Some soils, however, are of so light or sandy a nature that ploughing may not be needed, and stirring the ground well with fork or spade from time to time may answer well enough. Should time be very limited during the planting season it will be sufficient to work well where the tree is to be planted on stiff soils, and leave cultivating the spaces between the trees till later on, when the labor can better be spared; but on no account should this after-cultivation be neglected, as the greater the area of worked land round the trees the better, because when thus worked it absorbs far more moisture. When only a few trees have to be planted the best plan is to select dull showery days for the work, but where great numbers are planted this is not in all cases possible, and once started the operations must often be continued if lost time, with consequent increase in cost, is to be avoided. A great safeguard against injury to the tender plants is always to have their roots plunged in puddled earth, about the consistency of moderately thick cream. This is easily done by making a planting box out of an empty case, say a brandy case, which will make two handy sized ones if halved, with bent wire for handles. The puddled earth is placed in the box and the plants plunged in it, and thus they are provided not only with protection against exposure, but with moisture to help in starting them in their new home, which is an important matter in cases of large numbers, where watering cannot be resorted to. Of course, where but few require attention they can and should be watered till they get a fair start, after which proper surface stirring should be sufficient.

It is much better to plant when the ground, though moist, works freely without clogging, than to attempt it when sodden and sticky. In planting deciduous and other trees with roots of any length care must always be given to cut all fractured portions clean with a sharp knife to induce rapid healing; and ample room for the proper extension of all the roots is imperative. Pines and deciduous trees now require prompt attention, as the sooner they can be got in the more rain they will probably get and the better they will develop new root-growth before the warmer weather comes.

Gums and peppers can, in most cases, very well wait till later on, and where frosts are at all likely to be severe and long-continued these trees *must not be* planted yet if failure is to be avoided. The intense frosts which occurred so very late last year killed thousands of young trees at a time of the season when such results have never before been experienced, and point to the necessity for caution. If special shelter can be provided hardy trees of gums and peppers may be put out, but as a rule nothing is gained by planting them too early, for they seldom make a start to grow till the warmer days come, even if they escape ill effects from frost.

TREES ADAPTED FOR YIELDING SHELTER IN SOME SOUTH-EASTERN DISTRICTS.

By Walter Gill, F.L.S., F.R.H.S., Conservator of Forests.

Having already on a former occasion considered the primary question of the condition of soil and climate in some of the localities in the South-East, and seen how, to some extent, the difficulties arising therefrom can best be modified, the subject which now claims our attention is what kinds of trees are most suitable for planting under the circumstances generally existing.

In dealing with this matter it is desirable to note first of all that there are many places where a great deal of shelter may ultimately be secured by carefully fencing in patches of greater or lesser area, and protecting them both from all stock and vermin, so that in a few years' time young trees may come up by natural regeneration. There will probably be only a few old trees in these patches, but they will continue to produce seed from time to time, and thus supply quite enough to give a fine crop of young saplings in a comparatively brief time, say five or six years. The trees occurring on the rising grounds will be most likely the Sheaoak (Casuarina quadrivalvis), the common Teatree (Melaleuca parviflora), and the Box bush (Bursaria spinosa); also the stringybark, with large flowers (Eucalyptus capitellata), and the gum, variously known as "Pink" gum, "Scrub" gum, "Sand" gum, or "Hill" gum (Eucalyptus paniculata, variety fasiculosa), together with the Manna gum (Eucalyptus viminalis) and the Honeysuckle (Banksia marginata). The same plan may also be followed on the lower-laying land, though possibly with less satisfactory results, because in a great many instances the seedbed in its present condition may be too cold and inhospitable to bring about as good a growth as the higher and warmer land, which generally responds more rapidly to the influence of rains than the lower stiffer soils. The trees which will be met with on the flats will mostly be the Honeysuckle (Banksia marginata), the Swamp gum (Eucalyptus gunnii), the Swamp teatree (Melaleuca pustulata), the South Australian Bluegum (Eucalyptus leucoxylon) sometimes, and sometimes the Redgum (Eucalyptus rostrata), while occasionally the Bull or Swampoak (Casuarina lepidophloia) occurs. When any given spot has been successfully covered with a good growth of sturdy young trees the fencing material could be removed, provided the trees are high enough to be uninjured by the browsing of either sheep or great cattle, but if rabbits were likely to be troublesome it would be false economy to save a little wire or wire netting, and end by having the trees so satisfactorily established barked to the roots by the enterprising rodents. Should the regeneration growth be very thick it would be necessary to thin the young saplings judiciously from time to time, to let down their heads and allow them to increase in diameter of foliage, while strengthening the trunks at the same time.

It may not, however, be found advantageous to adopt the natural regeneration plan, but the seed of all the trees previously named could in most cases be gathered with advantage and sown for the rearing of young trees for transplanting, after preparing any given area for their reception. In collecting the seed a little systematic observation will soon show whether it is ripe enough for use, and the gathering of a few seed vessels will set all doubt at rest, for if they are placed in a dry warm spot they will soon open and emit the seed. On examining the mixed fertile and infertile seed coming from the same seed vessel, the fertile ones are in many cases readily noted by the difference in color, though in some instances they are almost identical. If the seed is good it will be plump and heavy compared with the abortive specimens, and ought, when carefully examined under a strong magnifying glass, to show no signs of any shrivelling in the skin. Should this be evident it is an indication that the seed is not perfectly ripe, and the main picking should therefore be deferred for a little time. Some gum seed, such as Sugargum, Bluegum of South Australia, and Stringybark can be told readily from the "chaff," as the infertile seed are termed, but others are smaller and of a color almost uniform with the chaff, as previously intimated. Redgum seed is thus harder to distinguish than the other gums alluded to, and seed such as Teatree, being much smaller, is harder still, affording little or no criterion from external appearances of the actual seed present, a matter only settled by sowing. All seed picking operations should generally be carried on in the hot settled weather; the capsules always open far quicker and better, and the seed comes out in a fitter, drier state for storing if required, while there is little risk of loss through rain; whereas, in uncertain rainy weather, heavy loss is certain from damp, and also from ants, which invariably carry off a quantity from the drying-sheets whenever seed is collected and dried in unsettled weather.

In addition to these local trees, the New South Wales River Oak (Casuarina glauca) will probably do well. It is often called Kingston's Sheaoak around Adelaide, and has been used with good results in many low-lying spots in forming little clumps of trees for cattle shelter. The Sugar gum (E. corynocalyx), being averse to cold sodden sites, and very frost tender, can hardly be recommended for general use in this connection, though occasionally it might be planted in a well-drained spot, in a favorable season. The Yate gum of West Australia (E. cornuta) is better adapted for the purpose in view, as it generally grows by the "claypans" in its own colony, and thrives fairly well in many places in the South-East. It is, however, rather liable to split under the strain of heavy winds, a disadvantage which it shares with the New South Wales River Oak; but the danger of injury from this source is lessened a good deal when several trees are grouped together. The pines most likely to be of service are the Aleppo pine (Pinus halepensis) and the Pinaster or Maritime pine (Pinus pinaster). The best sites for these will be on rising ground, sufficiently elevated to afford fair drainage. A hardy native shrub, sometimes called the "bottle brush," which has a handsome scarlet flower, and occurs very commonly in the Port Lincoln district on stiff land, near claypans, on Yorke's Peninsula, and (now rarely) in the South-East, also makes an admirable shelter. It is botanically known as Callistemon coccineus, belongs to the natural order Myrtaceæ, and has very fine seed, similar to its near relations the Teatrees.

The African Boxthorn grows well in many damp spots in the South-East, and makes a capital break-wind, either planted as a hedge round a homestead, or in masses, for stock shelter; and the common Tamarisk (Tamarix gallica) also affords excellent shelter, though in winter it loses its leaves, and thus for a time is of less value. It possesses, however, the advantage of growing very readily from cuttings, which is a very valuable quality not possessed by any of the trees hitherto referred to. Although the poplars are generally averse to continuous strong wind, yet there may be some positions where even these may be of considerable value, and I therefore include them in the trees described. The common Upright Poplar (Populus fastigiata) and the Grey Poplar (Populus canescens) grow readily from cuttings, and indeed, in many cases, strong stakes, say, 6ft. long and 1in. thick, will grow well if carefully put in about 2ft. deep. The Grey Poplar also propagates freely from suckers. The Weeping Willow (Salix Babylonica), the Bedford Willow (Salix Russelliana), and the Golden Osier (Salix viminalis) might likewise prove of some service in special localities, the great facility they possess for propagation by cuttings or stakes, in common with their near relations of the same order (Salicineæ), the poplars, making them at least worthy of brief reference.

In closing these observations a few words seem desirable regarding the rearing of trees. It is of the highest importance that a proper seed-bed should be prepared at the outset. Perhaps, as soils vary greatly in different localities, instead of endeavoring to indicate in definite quantities the kind of soil required to make this up, it will be better to give an example of the kind of seed-bed which generally proves successful, and thus to provide a model for imitation. Now, if we examine the kind of surface in which young seedlings are usually found growing we shall see that it consists of decayed leaves, branches, branchlets, twigs, bark, and other *debris* which have fallen to the ground, and as they gradually decayed have become mixed with the ordinary soil. This again has been added to by light particles of dust and sand brought by the wind, and a compost has thus been formed which, while being capable of excellent drainage, is also able to contain a very large amount of water, in consequence of the very absorbent nature of the humus produced by the decayed vegetable matter it contains. Here seed germinates readily and makes good roots. We cannot do better, therefore, than take this composition as our guide. What is known as virgin loam in the old country, and always held in high value for tree-rearing purposes, consists of the top spit or layer of grassy turf, which is really the decaying roots of the grass itself accumulated through long periods and mixed with light surface soil. The inherent vitality of this is well recognised in the current axiom among the farming community in the southern counties—"To break a pasture will make you and to make a pasture will break you." This is one very important factor in preparing a soil, if obtainable. Again, peat is another element of great importance in rearing young plants or trees; and the admixture of these two kinds of soil has ever been regarded as a compost of the highest excellence. But as such eminently suitable material may seldom be available, probably the well-rotted skimmings from paths or roadways, and thoroughly dead leaves, with some light surface sandy loam, will be as near an approach to the mixture described as may be obtainable, and will approximate fairly well to the example cited. Rubbish from the woodheap, sifted to moderate size, will make a good medium for drainage at the bottom of pots, boxes, or empty tins, and the fine dust from the same place will prove excellent light covering for the seed when sown. It must be noted that after the soil has been prepared the seed should be carefully sown, and then *only gently pressed its own depth into the soil.* A piece of board of suitable size like a mason's float will answer for this very well, and a light even sprinkling of the wood dust already alluded to will complete the work. Many a failure is caused through over-burying seed. Continuous watering is indispensable till the tender seedlings are up, after which watering once a day—in the evening—will suffice. Though shelter is required, a damp stagnant atmosphere should be avoided, as where a good circulation of air is wanting mildew is apt to occur with some species of trees. As they get well established every effort should be made to harden them as much as possible by judiciously exposing them to sun and air and gradually lessening the waterings. In this way they are the better prepared for the final transition to more open and exposed positions.

PRESERVATIVES IN DAIRY PRODUCE.

By G. S. Thomson, N.D.D., Dairy Instructor.

The use of preservatives in foods has become a subject of such importance that a special committee has been formed in London under the presidency of Sir Herbert Maxwell, the object of the committee being to gather evidence relating to the danger of preserving compounds, and to decide upon a standard regulating their use in dairy products and other foods.

The evidence up to date is very conflicting, as medical and scientific authorities of the highest repute differ in their opinions, and what has already been published points to a difficulty in arriving at a satisfactory solution of the question. From information gathered subsequent to the opening meeting considerable surprise has been felt in England at the extensive indulgence in preservatives for dairy products.

The fixing of a standard is urged as a necessary precaution against the free sale and use of chemicals that are altogether dangerous in the hands of misguided and careless people.

It is noteworthy that throughout the sitting of the commission some authorities have emphatically condemned preservatives as being nothing short of a sheer blind to uncleanliness in the treatment of dairy produce. There is a good deal to say in favor of this view, and doubtless if law did not step in to protect the consumer advantage would be taken, and the abuse of preservatives would end in more danger to the health of the public.

There are many kinds of preservatives in the market, and how the commission is going to fix a standard for each is a matter for conjecture. Numerous proprietary titles are given to salts and solutions sold for extending the keeping quality of milk, cream, and butter, and the active preserving ingredient contained in each is not essentially boracic acid—perhaps the safest of all the chemicals at present in use. Formalin is finding favor, but evidence is wanting to justify anyone to claim it as a safer, though it is a stronger preservative than boracic acid. Boracic acid, which we are most familiar with, is prepared from borax, a natural mineral substance.

Extensive experiments have been conducted with boracic acid to prove its harmless properties to health when used in small quantities. Dogs, rabbits, and guineapigs have been fed on food containing varying quantities of the preservative, and so long as the quantity did not exceed certain limits, the health of the animals was unaffected. The *Scottish Farmer* of March 31, 1900, concludes an article on this subject in the following lines:—"With regard to the quantity used in preserved foods, it is probable that it is never in excess of a quarter of 1 per cent. As it would seem highly probable that even four times that amount has no injurious effect on the health, it may be pretty safely concluded that the use of boric acid in the quantities usually employed as food preservatives is innocuous."

In the *Times* of November 23, 1899, the evidence of witnesses is given of the previous sitting of the commission.

One witness, a managing director of a large dairy produce firm in Glasgow, said that the percentage of boracic acid necessary for export butter was 1 per cent. of preservative, which meant ½ per cent. of acid. Any excess over that would show in the flavor and deteriorate the quality of the butter. There was less danger in the use of butter slightly treated with boracic acid than of heavily salted butter in which decomposition had started.

Dr. Vœlcker, the renowned chemist, stated that he was not particular about the use of preservatives in butter, but he would suggest that boracic should not be used in cream, and that where used in milk the fact should be declared. Concluding Dr. Vœlcker's remarks, evidence tended to show that 8 to 13 per cent. of the samples of milk analysed in Cardiff were found to be treated with preservatives, the percentage of the boracic used varying from 0·05 per cent., or 7 grains per quart, to 0·09 per cent., or 14 grains per quart, quantities which would be injurious to children.

There had been a prosecution at Cardiff when boracic acid in butter was found to be 1 per cent., or 71·4 grs. per lb. At Birmingham, in February of last year, a merchant was fined for selling Australian butter with 1 per cent. boracic acid, and in cases of the same kind £20 has been imposed upon sellers. Continuing the examination, the representative of the *Lancet* medical newspaper had analysed the milk supplies of eleven London hospitals, and had found that seven were free from preservatives; three contained boracic acid, and one formaldehyde. He would not put a stop to the use of antiseptics, save in the case of benzoic acid and formaldehyde.

In a copy of the *Dairy World* of last year I observed an article under the heading "Formalin Condemned." It showed that a milk salesman in London was fined £5 and costs for having put quantities of formalin into the milk. The magistrate thought formalin was injurious to health, and ought not to be used in milk.

Formaldehyde, comparatively speaking, is a new preservative and is very effective. It is usually added in the form of a 40 per cent. solution, which is called formalin. Two or three drops in a pint of milk keeps it fresh for three or four days, and the addition of 0·05 per cent. preserves milk for months. In the trade a more delicate solution of formaldehyde is generally employed, namely, 1 part of formaldehyde to 80 parts of water. It is stated that a quarter of a pint of such solution added to 17 or 18 gallons of milk keeps it fresh for at least three days. Readers may inquire how these preservatives act on the milk and cream and butter, and why the preserved products should have a higher keeping quality. It is well understood that milk is a fertile field for the multiplication of germ life, and that germs accompany particles of dirt and water, and, by the introduction of foreign matter into produce, contamination and deterioration follows.

From knowledge of the source of the dirt, assistance is given to the discovery of the species of germs.

Sewage water will abound with the microbes known as the colon group, and were sewage to get into milk for cheesemaking purposes, holey, spongy, and puffing cheeses would follow the action of these gas-producing germs. The photographs shown in last month's *Journal* will be sufficient to illustrate the change. Had a quantity of boracic acid been added to these jars of milk along with the sewage water, the milk would have remained unaltered for a considerable time. Experimental jars were prepared for the meeting of the Dairy Board. One jar of milk was inoculated with 5 c.c. of sewage water, and at the end of forty-three hours the whole curd was a mass of holes. Another jar was inoculated with double that quantity of water, but a boracic acid preservative was added, and at the end of the same number of hours no alteration in the appearance of the milk followed. It will be understood that preservatives kill and arrest germ life, and is also a protector of foods against the attack of many varieties of germs which are carelessly admitted. But when milk is preserved and used for cheesemaking the extent of the preservative will not be sufficient to completely check the activity of all resistant germs, hence their multiplication will continue in the ripening room against the feeble efforts of the lactic organisms. Cheesemakers who have experienced the evil effects of a preservative in the milk know that the development of acid is abnormally slow, and the quality of the curd far from resembles that shotty and elastic condition which follows well selected and carefully ripened milk. The sweet and fresh flavour is also wanting; and with these defects what can be expected from the curd when maturity should have been attained? The answer is simple—Inferior and low-priced cheeses.

In the case of buttermaking, perfect souring of cream is essential to the manufacture of choice butter, but one might inquire where and how does the lactic germ find an entrance? The choice and aroma-producing species abound in the cleanest dairy, and if sweet and carefully selected cream is exposed to the free and uncontaminated air of the milk room the germs will grow and multiply, and prime-flavored butter will be manufactured. Again, if the same dairy is unattended to, an injurious invader will take possession, and inferior butter of a short keeping quality will result. Again, if a preservative were added to the cream in the well-kept dairy, no longer would the butter have the same attractive flavor which it previously possessed; but like the milk for cheesemaking the desired ferment would find an enemy in the preservative. It is well understood amongst modern buttermakers that when the lactic germs have an uninvaded field for their multiplication, their rapid growth crushes to death and cripples the less numerous germs, although they are stronger in their power of resistance. This feature is strikingly illustrated in the system of pasteurisation. Pasteurising or scalding cream clears the field of the lactic germs and many of the intruders are killed, and the majority of what remains are disabled. The scientist discovers that a good field, free from troublesome weeds gives a seedbed favorable to a careful sowing, and there he scatters the seed as a pure culture of germs to grow and multiply, and produce in the cream their own distinct and attractive flavor, to be finally tasted in the butter.

The following table gives the result of an experiment showing the keeping properties of sterilised (so called) and preserved milk compared with pasteurised and raw milk, also with milk inoculated with germs of sewage water, and of milk compared with a sample strongly inoculated but preserved with boracic acid. The samples were tested at a higher temperature, viz., 70° F., than the air outside.

Table showing the Keeping Properties of Sterilised and Preserved Milk, &c.

Hour and Date of Testing.	Sterilised Milk. Temperature 212° F. for Ten Minutes.		Pasteurised Milk. Temperature 185° F. for Ten Minutes.		Raw Milk.		Inoculated Milk.		Inoculated and Preserved Milk.	
	Per Cent. Acid.	Condition.	Per Cent. Acid.	Condition.	Per Cent. Acid.	Condition.	Per Cent. Acid.	Condition.	Per Cent. Acid.	Condition.
June 4— 2·15 p.m.	0·20	Sweet	0·20	Sweet	0·20	Sweet	0·20	Sweet	Before adding preservative. 0·020 After adding preservative.	Sweet
7·30 p.m.	0·21	Sweet	0·22	Sweet	0·25	Sweet	0·27	Sweet	0·35 0·41	Sweet
10·30 p.m.	0·21	Sweet	0·22	Sweet	0·32	Slightly Acid	0·43	Acid	0·42	—
June 5— 9·30 a.m.	0·21	Sweet	0·22	Sweet	0·78	Sour	0·80	Sour	0·45	—
1·30 p.m.	0·21	Sweet	0·22	Sweet	0·88	Thick	0·84	Thick	0·47	Sweet
7·30 p.m.	0·22	Sweet	0·22	Sweet	Coagulated	—	Coagulated	—	0·57	Faintly acid
June 6— 9 a.m. ..	0·28	Sweet	0·34	Faintly acid	—	—	—	—	0·67	Acid
9 p.m. ..	0·73	Acid, but liquid	0·80	Acid, but liquid	—	—	—	—	0·90	Very acid, but liquid
June 7— 9 a.m. ..	0·91	Liquid	0·95	Thick	—	—	—	—	0·90	Very acid, but liquid

Boracic Acid and Buttermaking.

The question of adding boracic acid to milk, then to the cream, and finally to butter has been commented upon as a practice endangering the health of consumers and injurious to the quality of butter. The addition of a strong preservative successively to milk, cream, and butter results in a high percentage of the active preserving ingredient being left in the finished product, when there has not been sufficient care in separation, churning of the cream, and washing the butter grains. That neglect in washing out buttermilk leaves an increased percentage of boracic acid has been proved in the test referred to later on, and want of attention to this particular item in buttermaking is a most serious mistake on the part of the buttermaker. That preservatives are taken advantage of is a certainty, and milk suppliers who favor the practice are often tempted to abuse its usefulness. In other words, the preservative is used to relieve the suppliers of the care and cleanliness which is essential wherever milk is kept or handled if the buttermaker is to produce a high quality product. But the maker is not usually the milk-grower, and the factory manager may suffer loss at the instance of the factory directors when the directors themselves are abusers of the "innocent" perservatives. This, however, pertains more directly to cheesemaking, as preserved milk is entirely ruinous to the quality of cheese. It is true the factory manager is at the mercy of the suppliers; he is not equipped to enable him to detect preserving chemicals, and must therefore depend upon his sense of smell in the examination of milk supplies. As will be seen in the table of acidity determinations, that preserved milk with a high acidity reading of 0·50 is tabulated "sweet." Without the preservative that particular sample of milk would have been acid to smell, curdled, and distinctly sour to taste. Factories would find it profitable if they were equipped with the acidity apparatus for testing samples of milk, independently of the assistance it gives as a guide in the manufacture of both butter and cheese. This matter has been pointed out several times, and a special article was published in the *Journal of Agriculture* drawing attention of factory managers to the acidity test.

Enough has been said to warn suppliers of milk that all preservatives are not neutral and harmless salts and liquids, but often contain a substance which is hurtful where recklessly used. Turning to the usefulness of preservatives, we find that boracic acid cannot be dispensed with, and is of incalculable value to the butter industry. Quantities which are sufficient in the preservation of export butter are quite innocuous to consumers.

The addition of the acid to milk and cream where suppliers are situated at long distances from factories and creameries is preferable to sending these raw products in a deteriorated condition. Similarly with the use of the acid preservative in summer weather, when circumstances make it compulsory for the farmer to preserve his supplies, or otherwise sustain heavy losses.

It would be to the gain of the industry if suppliers would purchase their preservatives from their respective factories, where a good and reliable boracic acid compound would be always kept in stock. In the season of the year when the demand is greatest for preservatives many kinds are sold, and the action of these different preservatives of varied strengths will do harm to the output of butter in many factories.

Boracic Acid Experiments.

The tests were conducted on lines as near as possible to what occurs when a boracic acid preservative is added to milk on a Saturday to extend its keeping quality until Monday, and assuming that the cream and butter sometimes receives additional preservative, more acid was put into both cream and butter. The preserved cream was kept for a number of days, which is usually the case in country districts before sending to the factory. Altogether three tests were made, which extended over a period of twenty-seven days. The number of acid determinations altogether are 265, and fifty-eight specific gravity examinations (bottle and balance). Thirteen quantitative boracic acid analyses have been conducted at the School of Mines. The practical work connected with the experiment, viz., cream ripening, separating, and butter-making were kindly attended to by Mr. Anderson, of the milk pasteurising depôt, Angas Street, Adelaide.

The valuable information we gather from the results of the experiments shows that during the process of separation of the preserved milk centrifugal force removes the greatest percentage of the acid into the separator milk, leaving only a very small proportion in the cream. Again, after the addition of boracic acid to the cream, careful churning and washing caused the removal of most of the preservative. The quantitative analysis fully bears out this important result.

Although those analyses are recorded throughout the test to follow, it will be explicit to give the full analytical examination at this stage in the paper.

Test II.

Quantity of preserved milk, 15galls.
Quantity of preservative added, 151½grams.
Strength of preservative, 82·5 per cent. boracic acid.
Sample of milk taken from top of can, 0·019 per cent. boracic acid.
Sample of milk taken from bottom of can, 0·007 per cent. boracic acid.
Sample of mixed milk in can, 0·007 per cent. boracic acid.
Sample of separator milk immediately after separation, 0·08 per cent. boracic acid.
Sample of separator cream immediately after separation, 0·015 per cent. boracic acid.
Sample of cream after addition of 80grams. preservative, 0·08 per cent. boracic acid.
Sample of separator slime, 0·03 per cent. boracic acid.
Sample of butter milk, 0·11 per cent. boracic acid.
Sample of butter immediately after churning and before salt was added, 0·12 per cent boracic acid.
Sample of butter after addition of 83·2 grams. of preservative and a quantity of salt, 0·18 per cent. boracic acid.

It will thus appear, where boracic acid is freely used in districts located at considerable distance from creameries or factories, the separator and butter-milk will contain the highest percentage of the preservative; but that proportion will not probably rise to an extent to become injurious to calves or pigs fed upon such foods; and, again, where the preservative is used, it is not throughout the whole season of the year, but principally to extend the keeping quality of the milk from Saturday till Monday during the hot weather. When used in cold months it would be a waste of money to add quantities similar to that adopted in summer. In the case of cream, the great bulk will be unpreserved, which will mitigate the percentage of the boracic acid in the preserved lots. At intervals in the coming summer months examinations will be made to determine the extent of the boracic acid in these milks. When it is considered that both the milk and cream, as well as the butter, had separate quantities of the preservative added, the quality of the butter did not appear to be marked in flavor. Special attention will be given to the practical examinations of the butter at the end of the paper.

Test I.

Two 15gall. quantities of milk were received into scalded tins. To No. 1 tin 151½ grams (one and a half tablespoonfuls) of a powder, containing 82·5 per cent of boracic acid, was added. The powder was dissolved in distilled water, and the weight, per specific gravity bottle, was taken. No. 2 tin was kept as a control. The acidity determinations were made by means of the acidity apparatus, and separate pipettes were kept for each examination.

Acidity Tests.

T — per cent. of acid under the cream layer.
B — per cent. of acid taken from bottom of bulk of milk.

The acidity of milk before the preservative was added, 0·19 per cent ; the acidity of milk after the preservative was added, 0·20 per cent.

TABLE I.

Percentage of Acid in Milks taken from Bulk.

Hour and Date of Test.	Preserved Milk.	Taste.	Without Preservative.	Taste.
May 6—7·30 p.m.	T — 0·21	Sweet	T — 0·18	Sweet
	B 0·21	"	B — 0·18	"
May 7—9·30 a.m.	T — 0·21	"	T — 0·21	"
	B — 0·21	"	B — 0·22	"
1·30 p.m.	T — 0·21	—	T — 0·22	"
	B — 0·23	—	B — 0·24	"
7·30 p.m.	T — 0·23	Sweet	T — 0·30	Faintly acid
	B — 0·24	"	B — 0·30	"
May 8—9·30 a.m.	T — 0·25	Sweet, with a faint bitterness	T — 0·64	—
	B — 0·32		B — 0·64	Very acid
9·30 a.m. ...	Sample from milk mixed, 0·30		Sample from milk mixed, 0·64	

A sample was taken from the top and bottom of the preserved milk, and one after the milk was thoroughly mixed. The following are the acid readings :—

	Top.	Taste.	Bottom.	Taste.	Mixed.	Taste
May 8—12·30 p.m. ...	0·29	Sweet	0·34	Acidity perceptible	0·33	—
7·30 p.m. ...	0·36	Somewhat acid	0·41	Acidity distinct	0·44	Distinct acidity
May 9— 9·30 p.m. ...	0·70	Very acid	0·65	Very acid	0·75	Very acid

Specific Gravity Weight.

Grams	Grams.	Grams.
797·5	796·7	795·7

It is very evident that the one and a half tablespoonfuls of the powder had a marked influence over the keeping quality and taste of the milk. This is further borne out in samples expressly preserved with a higher percentage of boracic acid, and it also shows how the acid can be detected by means of the acidity apparatus when added to milk in excessive quantities.

TABLE II.

Date and Hour of Testing.	Raw Milk.	Condition.	Heavily Preserved Milk.	Condition.
May 4 –	Per cent. Acid.		Per cent. Acid.	
2·15 p.m.	0·20	Sweet	0·20 before adding preservative	Sweet
2·20 p.m.	0·20	—	0·41 after adding preservative	—
7·30 p.m.	0·25	Sweet	0·41	Sweet
10·30 p.m.	0·32	Acid taste	0·42	Sweet
May 5—				
9·30 a.m.	0·78	Sour and thick	0·49	Sweet
1·30 p.m.	0·88	Complete coagulation	0·50	Sweet and liquid
7·30 p.m.	—	—	0·55	Slightly acid and bitter
May 6 –				
9·0 p.m.	—	—	0·80	Acid, but liquid
May 7—				
9·0 a.m.	—	—	0·80	Acid, but liquid
May 8—				
9·0 a.m.	—	—	0·80	Acid, but liquid

The temperature of the milk was 70° F.

Returning to the determinations of acid in the three lots of preserved milk, it will be noticed that at the first examination the sample from the bottom showed a higher percentage of acid than the sample from the top; but the later tests show that the percentage of acid rose proportionately higher in the sample from the top. During the thirty-three hours the acid increased from 0·29 per cent. to 0 70 per cent. in the top sample, as compared with a rise of 0·34 per cent. to 0·65 per cent. in the bottom.

In tasting I observed that the acidity of the milk where boracic acid was in use did not compare with the natural acidity of the unpreserved milk. This was clearly shown in the case of the separator samples in the second test.

Specific Gravity Weights.

Water distilled 60° F. Milk for convenience 62° F.

	Preserved Milk. grams.	Without Preservative. grams.
May 7—1·30 p.m.	795·5	789·7
7·30 p.m.	T—797	T—794·3
	B—797·9	B 795·5
May 8—9·30 a.m.	T–797·3	T—796·5
	B –798·1	B—796·0
1·30 p.m.	T—797·1	T—795·3
	B –798	B—795·6
7·30 p.m.	T—797	T—794·87
	B—797·5	B—795·27
May 9—9·30 a.m.	T—798	T—795·3
	B–798·2	B—795·8
	Mixed Sample.	Mixed Sample.
	796·3	793·2

The specific gravity of the preserved milk is a little higher than the unpreserved, due no doubt to the specific gravity of the added preservative. The variation between the top and bottom weights of the preserved milk is not very marked, but the latter is uniformly heavier.

As the control milk was too acid for the separation process a second test was commenced.

Test II.

On the 23rd of May 15galls. of fresh sweet milk was put into a tin which had been scalded and cooled down. At 1·15 p.m. of the same day the percentage of acid was taken, and showed 0·18. Immediately afterwards 151½ grams of the 82·5 per cent. boracic acid powder was added. After thoroughly stirring in the preservative the acid reading was again taken, and showed 0·19 per cent. The tests were afterwards continued, but the control milk was not set until two days afterwards.

Acid Tests.

Date.	Preserved Milk. Per Cent.	Taste.	Not Preserved. Control.	Taste.
May 24—	T—0·24	sweet	—	—
11 a.m.	B—0·23	"	—	—
May 24—	T—0·30	faintly acid	T–0·18	sweet
7·30 p.m.	B—0·31	"	B—0·18	"
May 25—	T—0·38	rather acid	0·1950	sweet
9 a.m.	B—0·46	bitter acidity, pungent	0·1950	"
	Immediately before separation.		Immediately before separation.	

Specific Gravity.

May 25—	T—796	—	T–794·9	—
9 a.m.	B—796·5	—	B—795·4	—

The last acid test of the preserved milk was very characteristic in imparting to the taste an acidity entirely different from the acidity of normal milk.

Separation and Acidity Tests.

To show the great difference in the extent of acidity, it will be well to give the last test of the bulk milks.

Milk before Separation.

	Preserved. Per Cent. Acid.	Non-preserved. Per Cent. Acid.
May 25—9·0 a.m.	T—0·38	0·1950
	B—0·46	0·1950

After Separation on Same Date.

Separator milk—One gallon samples.

May 25—12·15 p.m.	0·42	0·17
May 26— 9·0 a.m.	T—0·74	T—0·68
	B—0·80	B—0·72
May 27—10·0 a.m.	T—0·62	T—0·60
	B—0·73	B—0·70

Acid in Cream.

	Preserved.	Non-preserved.
May 25— 1·30 p.m.	0·26	0·1450

To the cream was added 80 grams of the dissolved preservative.

	Acid immediately after Preserved.	Non-preserved.
May 25— 1·35 p.m.	0·41	—
May 26— 9·0 a.m.	T—0·52	0·43
	B—0·55	0·44
May 28—11·0 a.m.	T- 0·58	0 63
	B—0·60	0·66
	Mixed Sample.	Mixed Sample.
May 29—11·0 a.m.	0·53	0·58

It was very noticeable that the preserved cream kept comparatively thin up to the end of testing while the unpreserved cream went thick.

Quantitative Analysis

Separator milk	0·08 per cent. boracic acid
Before additional preservative—Cream	0·015 per cent. boracic acid
After additional preservative—Cream	0·08 per cent. boracic acid

The acid in the preserved separator milk, 0·42 per cent., is much higher than in the case of the control, 0·17 per cent.; but when we compare these figures with the acidity of the cream preserved, 0·26 per cent., control 0·1450 per cent., we find that the separator has relieved the cream of a considerable quantity of acid. The quantitative analysis which is given above shows that the percentage of boracic acid in the separator milk is similar to the percentage of acid in the cream after the addition of 80 grams of the preservative.

Separator Slime.

	Weight of Preserved Slime.	Weight of Non-preserved Slime.
May 25—12·30	8ozs.	2¾ozs.

Quantitative analysis—Preserved slime, 0·03 per cent boracic acid.

Owing to the extent of the acidity in the preserved milk before separation we have a large quantity of slime.

Acid in Separator Slime.

Equal quantities of separator slime were dissolved in distilled water.

	Preserved Slime, per cent. Acid.	Non-preserved Slime, per cent. Acid.
May 25 - 12·45	0·26	0·26
May 25—2·45	0·26	0·26

Sample Creams in Laboratory taken from Bulk.

	Preserved. Per Cent. Acid.		Non-preserved. Per Cent. Acid.	
May 26—9 a.m.	T—0·52		0·51	
	B—0·52		0·51	
May 27—10 a.m.	T—0·57		0·61	
	B—0·60		0·62	
May 28—10 a.m.	T—0·57	Liquid at bottom and pretty fresh in general condition	0·65	Thick on top and smelling strongly
	B—0·63		0·70	

It is seen here that the preserved cream has beaten the unpreserved lot in the low degree of acidity, similar to the bulk tests. The percentages of both lots at 9 a.m. on May 26 are similar, while the percentages of the non-preserved at the same hour and date show that naturally the cream develops a quicker acidity when kept in smaller quantity when at a higher temperature.

The cream was kept until the 29th of the month, and at 11 a.m. it was churned, at a temperature of 62° F. The time occupied in churning the preserved cream was thirty minutes, and the time required for the unpreserved was forty-five minutes.

Summary of Time.

The first lot of milk was received at 11 a.m., May 23; 151½ grams of preservative added, 1·15 p.m., May 23; milk was separated, 11 a.m., May 25; 80 grams. of preservative added, 1·30 p.m., May 25; cream was churned at 11 a.m., May 29; making in all six days from the time the milk was received.

The control milk was set at 7·30 p.m , May 24. Both creams were churned into butter grains, and the buttermilk was thoroughly removed from each lot.

Acid in Buttermilk and Water.

Both butters were thoroughly drained in the churn, and the buttermilk was tested. The washing water was also collected and tested.

	Preserved Buttermilk. Per Cent. Acid.	Non-preserved Per Cent. Acid.
May 29—12·30 p.m.	0·58	0·65
May 31—12·30 p.m.	0·72	0·67
	Water.	Water.
May 29—12·30 p.m.	0·4	0·14
May 31—12·30 p.m.	0·77	0·77

Quantitative analysis—Buttermilk, 0·11 per cent. boracic acid.

The final analysis does not show a high percentage of boracic acid when we again consider that 151½grams. of the preservative was added to the 15galls. of milk, and 80 grams to the cream, the quantity of cream amounting to seven pints at the close of the testing. To 3¼lbs of butter, 83·2 grams of additional preservative were added; the remaining butter was kept in order to compare the keeping properties of the two lots.

Analysis of butter before additional preservative. 0·03 per cent. of boracic acid; analysis of butter after additional preservative, 0·10 per cent. boracic acid. When butter is found to contain 1 per cent. of boracic acid the buttermaker must have been exceedingly liberal with its use.

Butter Scoring.

Lot II.—Scored immediately after manufacture, May 29.		Total Points.	Points Awarded.
1. Butter from preserved milk and cream not salted	Flavor	50	44
	Texture	25	25
2. Unsalted butter from preserved milk and cream, with additional preservatives	Flavor	50	45
	Texture	25	20
3. Sweet, not preserved	Flavor	50	45
	Texture	25	25
4. With salt, not preserved	Flavor	50	46
	Texture	25	20

Scored June 8.

	Total Points.	Points Awarded.		Total Points.	Points Awarded.
1. Flavor	50	38 Rancid	2. Flavor	50	45
3. "	50	45	4. "	50	46

In scoring the first four there was very little difference in flavor, a perceptible evidence of weakness being noticeable in all, a condition in the unpreserved butter to some extent due to the season of the year, and likewise affecting the preserved, but to a less extent.

The second test very distinctly showed that No. 1 butter was rancid, although not strong in the flavor. the remaining three being unaltered. This is very interesting, and opens a way to further investigation. Rancidity was found to be very pronounced and accompanied with a pink mould in a sample of butter from preserved milk and cream without additional preservative being added to the butter, while the sample with the extra preservative was normal in appearance and free from rancidity.

In this test the milk (15galls.) was preserved with one tablespoonful of the same kind of preservative, milk was kept for two days, after separation one teaspoonful of preservative was added to the cream, and the cream was churned four days afterwards. Four drachms of preservative was added to the butter after one pound was kept back.

Per cent. of acid in separator milk after separation, 0·22.
Per cent. of acid in cream after separation, 0·16.

This bears out a former test.

Quantitative Analysis of Butter—
Without salt and extra preservative, 0·12 per cent. of boracic acid.
With salt and extra preservative, 0·18 " "

The butter had a considerable quantity of buttermilk left in, which will account for a high acid analysis compared with the other test.

Lot I.—Tested May 17.

	Total Points.	Points Awarded.
1. Without salt and extra preservative—Flavor..	50	43
2. With salt and extra preservative Flavor..	50	45
Tested June 8.		
1. Without salt and extra preservative—Flavor..	50	None
2. With salt and extra preservative Flavor..	50	40 (faintly rancid)

The second examination of No. 1 showed that the butter was completely discolored with a pink mould throughout the body of the butter, and very rancid. Second examination of No. 2 proved that a faint rancidity was present.

Lot II.—Scored June 18.

1. Flavor very bitter. 2. 40 points.
3. Flavor very rancid. 4. 42 points.

Lot I.—Scored June 18.

1. Without salt and without extra preservative—Discolored.
2. With salt and extra preservative—Becoming rancid.

Final Scoring.

Lot II.—June 22.

	Flavor.
1. Unsalted butter, from preserved milk and cream................	Very bitter, with pink discoloration
2. Butter from preserved milk and cream, but salted, along with additional preservative	Unchanged
3. Sweet butter, not preserved..................................	Rancid
4. Butter, with salt, not preserved	Musty

Lot I.

1. Complete discoloration, becoming dark. 2. Rancid.

The final examination shows that the flavor of No. 2 is unchanged, and No. 4, which had 42 points against 40 of No. 2 at last examination, has deteriorated, with a musty flavor. It is noteworthy that No. 1 developed an exceedingly bitter flavor, distinct from the other samples, and in comparison to No. 1 of Lot I. in the last examination.

Conclusion.

The following are the conclusions drawn from the above tests :—

1. That one and one-half tablespoonfuls of preservative, containing 82·5 per cent. boracic acid, and added to 15galls. of milk, showed a rise of 0·11 per cent. acid in the milk at the end of thirty-eight hours. In a similar quantity of milk, without a preservative, the percentage of acid rose 0·36 in the same number of hours. At the expiry of the thirty-six hours the preserved milk was faintly acid to taste, while the unpreserved milk was very acid.

2. The percentages of acid and specific gravities of the preserved milk were found to be lower at the top of the milk supply, when compared with the bottom, and proportionately lower than the unpreserved milk. (See quantitative analysis.)

3. Boracic acid gives to milk a liquefying property in the presence of a high percentage of lactic acid, similar with milk after sterilisation by heat.

4. Milk preserved with boracic acid may slowly rise in the percentage of acid, but it may suddenly increase to a high percentage in an abnormally short time.

5. There accompanied the preserved milk, separator milk, and cream a faint bitterness which was not noted in the unpreserved samples.

6. The boracic acid added to the milk was principally expelled in the separator milk in the process of separation.

7. That 80 grams of preservative was added to the cream in test II., and showed a rise of 0·08 per cent. at the end of 69½ hours, while the unpreserved cream gave a rise of 0·23 per cent. acid in the same number of hours.

8. The boracic acid added to the cream was to a large extent removed in the buttermilk and washing water, which is confirmed by the quantitative analysis. Test No. 1 had less boracic acid added to the milk, cream, and butter, but a higher percentage of boracic acid was found in the butter, the result of insufficient washing of the butter grains to free them from the buttermilk.

9. Milk preserved with boracic acid and the cream again preserved with additional acid will produce sweet unsalted butter of a low keeping quality, quickly affected with rancidity and bitterness.

10. A pink mould will flourish in the presence of boracic acid in butter, when both the milk and cream have been preserved and when no salt has been added to the butter. Confirmed by inoculation experiments.

11. Bitterness accompanied the butter manufactured from preserved milk and cream when no salt was used in the butter, and the bitterness became exceedingly strong after a period of keeping. Butter with the salt and additional boracic acid did not develop the pronounced bitterness.

12. The best keeping butter in the test proved to be the sample to which preservative was added to the milk, cream, and again to the butter, but the butter was salted at the rate of 3½ per cent.

Preservatives in Foreign Butter.

In the May number of the *Analyst* the following tables are given, showing the results of analyses for boracic acid in samples of butter representing shipments from countries exporting butter to the English market. Unfortunately no analyses were made of Australian samples :—

Samples Examined for Preservatives.

Origin of Samples.	Total Samples Examined.	Samples not containing Preservatives.	Samples containing Boric Acid.		
			Average in Grains per Pound.	Highest in Grains per Pound.	Lowest in Grains per Pound.
Finnish	74	73	8·3	—	—
Danish............	85	82	5·3	8·0	4·0
Irish	37	2	24·7	46·0	5·0
Swedish	13	13	—	—	—
Canadian..........	10	9	9·0	—	—
German	8	8	—	—	—

The analyst says eighty-five specimens of Danish butter were examined, and in three samples only could any preservative be found, namely, boric acid, and the highest quantity contained in a sample was 8grs. per lb.

Of the seventy-four samples from Finland, only one was found, upon examination, to contain boric acid, namely, 8·3grs. per lb.

Therefore the percentage of the samples of Danish and Finnish butter containing preservative is very low, and scarcely worthy of notice.

The same cannot be said of the Irish production, of which all the samples were found to contain boric acid varying in quantities from 5grs. to 46grs. per lb.

Of the thirty-five samples in which preservative was found, eight contained upwards of 35grs. per lb. of boric acid, including two containing above 40grs.; nineteen showed result between 20grs. and 35grs. per lb.; and seven samples contained quantities below 12grs. of boric acid.

LIVE STOCK NOTES.

Tuberculin Test.—Stock owners are slow to adopt the tuberculin test for tuberculosis in their cattle, but occasionally it is done. Mr. Inspector Williams last year submitted one dairy herd to the test, and some of the cows reacted. These were all killed and proved tuberculous Following this up, the owner lately requested a further test to be made on his young cattle, most of them the progeny of tuberculous animals. This has been done, with the result that no reaction has occurred, and the owner is now satisfied that his cattle are free from disease.

Lambs Poisoned.—Mr. F. B. Clarke, Reedy Creek, South-East, had several lambs die suddenly. Upon careful *post-mortem* examination by Mr. T. H. Williams, Stock Inspector, particles of suet were found mixed with the food in their paunches. This fat was fed to a mouse, which died at once. Chemical tests proved the presence of strychnine, and inquiry elicited the fact that the carcases of several sheep in the paddock where the lambs were running had been strychnined to kill foxes. The lambs had evidently been nibbling the fat from these carcases; hence the result.

Microscopic Worms in Sheep.—Mr. T. H. Williams, Stock Inspector, South-East, notes that very many weaners in that locality have died. The skin, eyes, and lips look pale, and an offensive diarrhœa accompanies the symptoms, causing the animals to become very weak, ending in death. Upon opening, the mucus membrane of the stomach is found to be swarming with minute worms, which when magnified to 90 diameters appear only ¼in long. They are buried in the membrane, and in some cases form almost a feltwork. They are found also in the intestines. They are most probably taken up by the sheep in the pasture. So far no treatment has been discovered that will not also kill the sheep. Good results have followed liberal feeding and treatment with sulphate of iron. Mr. Williams thinks this accounts for one of the so-called forms of coast disease.

Tuberculosis in Milch Cattle.—Mr. Needham, Deputy Chief Inspector of Stock, visited the country around Two Wells and the Lower Light, and made a careful inspection of between 300 and 400 cattle. Twenty-two cases of disease were found; six *post-mortem* examinations were made, confirming the diagnosis of the disease. On some of the farms the cattle appeared healthy. Nearly all condemned were milch cattle. The quality of the stock generally throughout the district is good, and most of the owners were pleased to have the cattle examined. As usual, many of the milking sheds were in very dirty condition, and there is a great want of cleanliness in connection with animals from which the public are supplied with milk and butter. These herds should be tested with tuberculin, so that all doubtful cattle could be isolated, and the diseased animals cleared out.

AUSTRALASIAN EXPORT STATISTICS.

The following statistics relating to the trade in the staple products of the Australasian colonies have been issued by Mr. J. J. Fenton, Assistant Government Statist for Victoria :—

IMPORTS AND EXPORTS, 1899.

	Total Value of— Imports.	Total Value of— Exports.
Victoria	£17,952,894	£18,567,780
New South Wales	25,594,315	28,445,466
Queensland	6,764,096	11,942,858
South Australia	6,884,357	8,388,396
Western Australia	4,473,532	6,985,642
Tasmania	1,769,324	2,577,475
New Zealand	8,739,633	11,938,335
Total	£72,178,152	£88,845,952

WOOL EXPORTED, 1899.

	Quantity (lbs.)	Value.
Victoria	121,877,604	£5,701,410
New South Wales	240,019,494	11,738,607
Queensland	71,138,515	3,390,779
South Australia	48,166,812	1,889,905
Western Australia	9,948,417	423,296
Tasmania	8,635,472	357,757
New Zealand	147,169,497	4,324,627
Total	646,955,811	£27,826,381

BREADSTUFFS IMPORTED AND EXPORTED, 1899.

	Wheat, Flour, and Biscuits.	
	Imported. Bushels.	Exported. Bushels.
Victoria	242,053	10,904,064
New South Wales	3,412,933	1,298,334
Queensland	2,332,480	2,252
South Australia	13,158	5,623,160
Western Australia	638,007	2,060
Tasmania	399	413,110
New Zealand	7,721	2,992,318
Total	6,646,751	21,235,298

BUTTER EXPORTED, 1899.

	Quantity (lbs.).	Value.
Victoria	36,254,269	£1,464,830
New South Wales	7,987,664	347,262
Queensland	1,159,255	49,517
South Australia	1,867,157	81,083
Western Australia	6,372	315
Tasmania	44,052	1,812
New Zealand	15,241,632	571,799
Total	62,560,401	£2,456,618

CHILLED OR FROZEN MEAT EXPORTED, 1899.

	Mutton.	Beef.
Victoria*	£181,969	£17,474
New South Wales	290,411	41,810
Queensland	37,265	810,640
South Australia	36,289	—
Western Australia	3,094†	—
Tasmania	—	15
New Zealand	1,768,555‡	197,009
Total	£2,317,583	£1,066,948

* These figures represent the net exports, *i.e.*, after deducting imports. The imports were as follows :—Beef, 5,567 centals, valued at £4,528 ; mutton, 55,946 centals, valued at £47,565. There were also exported —Pork, 224 centals, valued at £485 ; poultry, 1,645 packages, valued at £2,228 ; and rabbits and hares, 2,353,296 pairs, valued at £116,726. † Including quantity and value of beef exported. ‡ Twenty-seven per cent. of this consisted of lamb.

Australasian Pastoralists' Review.

POULTRY NOTES.

By D. F. Laurie.

As is usual at this season of the year, I am in receipt of numerous letters asking for advice on the subject of the most desirable breed or breeds of poultry for general purposes I am most anxious that our country breeders and producers generally shall be able to obtain good specimens of the class of bird most suitable for their needs. Those who live at a considerable distance from a good market will find freight, &c., on table poultry a considerable item. No doubt at some future time we shall see the excellent English parcels post system adopted, whereby the producer and consumer are brought together, and by means of which poultry, butter, eggs, &c., can be sent at a small cost, and without delay. However, if one finds that the cost of sending table poultry to market is too great, I should advise egg production as a profitable occupation. It may be urged that the greater number of eggs are laid at a time when the price is low, and that even the yearly average price is too low for profit. As an answer to the first objection I have only to say that, with a good percentage of winter layers, early hatching, correct feeding, and proper housing, an abundance of eggs at the season of scarcity will result. Again, as regards the low prices, the case is very simple. Pen up all male birds separately; you are then assured of infertile eggs, which may be readily preserved, and kept quite fresh for several months until prices have improved. Numbers of householders and others do this with the most gratifying result, and this system could be generally adopted. Those who are nearer to market can also make much money by rearing table poultry of all sorts. It is important, however, to proceed on definite lines. Breeds which are most satisfactory as layers are, as a rule, worthless for the table, and *vice versâ*. I will give a short outline of a few of the noted breeds, and, to simplify matters, will divide the poultry into three classes, viz., egg layers, table birds, and general purpose or all-round birds.

For egg production the following pure breeds stand ahead of all others:—Minorcas, Leghorns (various colors), Andalusians, Hamburgs (these, with the exception of the black variety, lay rather small eggs). As cross-breds the progeny of any two of the above breeds will prove hardy layers of abundance of eggs. Very often we find that more attention has been given to appearance than to utility points, and the power of laying numerous eggs is dormant, and even if this is the case with female and sire of different breeds, the union will nearly always result in a complete revival of the power in the progeny. Still, there is not the slightest reason why the best results should not be obtained from pure bred birds of the highest class. As I have frequently remarked, egg-laying is more a matter of strain than breed. Anyone can found a strain of fowls. If you continuously select the eggs of your best laying birds for incubation, you will in time possess a strain of exceptional layers, and in time the name of that strain will be famous as that of a great laying strain. But, remember, that in founding a strain of layers due attention must be paid to size and build, nor must due introduction of fresh blood be neglected, or in time failure will result. There is a vast difference between a good egg and a poor one. The above fowls are to be recommended, and if a good flock of Indian Runner ducks is also kept, there will always be eggs to sell, provided always that the birds are properly fed and housed. Now, none of these breeds are good table birds, even when young. The Runner ducklings are excellent, but very small.

For table poultry breeding, we will first consider fowls. What is wanted is a bird which will mature quickly, and always present a plump appearance, at the same time carrying abundance of flesh of fine quality. Now, mongrels and Asiatics rarely have sufficient length of keel, or breast bone, to carry much meat in the most desired positions, viz., breast, wings, &c. The largest fowl does not necessarily carry the most meat. I have often helped eight or ten people liberally from a first-class cockerel which could almost be carved with the back of the knife. As regards some of the mongrels one sees at auctions doing duty as table fowls, it can only be said that their great merit is toughness. Many people do not eat poultry, because it is so difficult to obtain good decent table birds, and also because they have become weary of purchasing these tough specimens. The aim of the breeder should be to produce birds which will fatten and mature at a very early date, and at not too great a cost for food. The results of countless experiments in different parts of the world, and under varying circumstances. conclusively prove that the breeds I am about to mention are those best suited for the production of first-class table birds, and ar thee most profitable. The pure breds are Old English Game, Indian Game, and Dorkings, in the first class; and Orpingtons, Wyandottes, Langshans, Scotch Greys, and Plymouth Rocks, in the second class. These latter are also good layers, especially in cold weather, and may be termed all-round fowls. The table fowl which gives the most satisfactory results from every point of view is the result of a cross between the Indian Game and Dorking. They are very shapely, and carry a great quantity of meat of the best quality. If either an Indian Game or Old English Game cock be crossed with hens of any of the above-mentioned breeds, the resulting table fowls, if generously fed and cared for, will be ready for sale as first-class chickens at about sixteen weeks old. Orpington and Wyandotte pullets often lay before they are five months old, and are then of a good size. Ordinary farm chickens of the same age as these crossbreds, when dressed for cooking, look like skinny attenuated scarecrows alongside of these crossbreds Again, a Dorking cock of good size may be mated with hens of the other breeds with very excellent results. Specimens of the above breeds can be obtained from 10s and upwards. It is far better to start in a small way with a few good birds, and gradually breed a good flock for future operations. With care, from a pen of a male and three females, from fifty to 100 young birds should be bred and reared in a season, and these will, when sorted out, leave a nice flock of young ones for next year's operations. Do not indulge in haphazard breeding; select your eggs for hatching with a definite end in view.

Now we come to a very profitable class, the duck. The average farm duck is a small, mean-looking bird, carrying but little flesh, and yielding very few eggs at one season of the year only. I referred to the Indian Runner duck as a layer; it is a small bird, rarely exceeding 4lbs. in weight, but it is a wonderful layer at all seasons of the year, and the eggs are of a good size also. The laying powers of other breeds of ducks can be much improved by the judicious introduction of Indian Runner blood, and much more use should be made of these grand little birds. I cannot hold out any hopes of profit from common ducklings; they do not attain sufficient size, and consume a great quantity of food for little result. To make duckling-breeding pay the breeder must discard his common birds and go in for the large pure breeds. The best are the white birds—the Aylesbury and Pekin. They are better than Rouens and Cayugas, which are also large (the latter is a good layer), but being dark birds, the pin feathers, if any, present a disagreeable appearance. The most approved duckling is the result of a cross between the hardy good-laying Pekin and the Aylesbury, so noted for the fine quality of its flesh. I saw a shipment of these in Victoria which averaged 5½lbs dressed, at nine weeks old. Another good cross is Indian Runner drake and Pekin or Aylesbury duck; the resulting ducks are excellent layers, while the ducklings mature rapidly and do not show much diminution in size. Four pounds weight when dressed is a nice weight for a nine-weeks-old duckling. If killed at this date, or even a week earlier if fit, no pin feathers will be visible; these appear after about ten weeks, and spoil the sale of the birds. If care is taken with Rouens and Cayugas, very fine ducklings of either sort can be bred, and moreover the flavor, especially of the latter, is excellent. These cost from 10s. a bird upwards; occasionally one can procure them for less, but not as a rule. In all cases I refer to suitable stock birds.

In geese we find a much-neglected branch of poultry. The common goose is small, and, as one only eats gosling, there is seldom enough flesh on the average market bird to warrant the trouble of cooking. I have seen hundreds of goslings sold at Christmas time, and very few reached 8lbs. live weight. Why a pure-bred duck, bar an Indian Runner, would have little chance of winning a prize at such a weight in fair competition. For market purposes the Toulouse and Embden are the varieties to select. Even the introduction of a good gander or two would do good. I saw about sixty goslings of the above breeds in Victoria; they had not feathered properly, but the average weight was about 16lbs. Of course, these were fine and of high class, but there is no reason why the average farm gosling should not attain 10lbs. to 12lbs. weight if bred from good stock. The China goose is a small bird, but is a great layer and very hardy and quick to mature. Embden and Toulouse geese are rather expensive. In Victoria good pairs cost about £3. There are a few in this colony, and perhaps they could be obtained for less. Gander and goose must be unrelated, and should not be used for breeding till two years old, or the progeny will be small and the general results unsatisfactory.

Turkeys, if the right sorts are bred, will prove as profitable as any farm stock. There is a great extent of suitable country in this colony. Most of our turkeys are very much inbred and small in size. Careful selection of the largest procurable two-year-old hens, mated with a pure-bred two-year-old American Bronze turkey gobbler, would result in a quick-growing, hardy bird, which should weigh 15lbs. to 16lbs. the cockerel, and 10lbs. to 12lbs. the pullet, at ten to twelve months. This is the class of bird for export; there is a good market for such in England. There are a few good ones in the colony. Twenty pounds weight for the cock and 15lbs for the hen are good weights for breeding.

USE OF COMMERCIAL FERTILISERS IN SOUTH AUSTRALIA.

By W. L. Summers, Inspector of Fertilisers.

The present year's seeding operations, as far as wheat is concerned, being practically ended I propose to give a few particulars concerning the use of commercial fertilisers with the wheat crop in South Australia during the present seeding, as compared with past seasons.

The use of commercial fertilisers on an extended scale in South Australia dates from the 1897 seeding, as will be seen from the yearly imports given at conclusion of this article. It was estimated that in 1897 60,000 acres of wheat crops were manured, while the following year the area was about 250,000 acres, and last year nearly 400,000 acres. The figures in each instance are estimates made by myself after careful inquiry, and, though not supposed to be exact, are as nearly correct an estimate as it was possible to make. Last year's estimate was based upon the quantity of manure imported from December 1st, 1898, to May 31st, 1899, and the quantity of manures produced at local factories, the total coming to over 20,000 tons. I find, however, that in regard to local production some considerable quantity was included twice in the total—once as the crude material, and again in super., super. guano, &c. This, with the amount of imported fertilisers carried forward, has led me to conclude that the estimate was 10 per cent. too high, and the area estimated to have been manured would be reduced accordingly. During the present season I have kept accurate records of every shipment of imported fertilisers, and, having been furnished by most of the principal local manufacturers with confidential statements of their outputs, I am able to furnish as accurate an estimate of the quantities used as it is possible to obtain; in fact, it is practically the only estimate that is available.

In dealing with the quantities of imported fertilisers I take the imports from December 1st to May 31, less re-exports, as practically the whole of the quantity used for wheat is imported during the six months in question. Any arriving after May 31 has but little prospect of being used for the present season. During the 1899 seeding season 13,500 tons of commercial fertilisers were imported, of which fully 1,200 tons of Thomas phosphate were carried over. For the present season 20,000 tons were imported which, added to the amount carried forward from previous season, gives a total of 21,200 tons available, allowance being made for quantities re-exported and no account taken of several hundred tons of high-priced fertilisers, of which only very small quantities would be used for cereal crops.

Local production consists of bonedust, bone manure, guano, and bone and guano supers. The six months' output may be taken in round numbers to be as follows:—

	Tons.
Bonedust and bone manures	1,500
Super. and mixed manures	3,000
Guano	500
Total	5,000

Of the mixed manures fully 600 tons are included in the inported fertilisers. and about 1,000 tons of bonedust, &c., are used by gardeners and orchardists, making the quantity of local fertilisers used for cereals 3,400 tons. In this estimate no account can be taken of the considerable quantities of native guano obtained by the residents from the islands in and about Spencer's Gulf and the West Coast, as there is no way of arriving at even a fair estimate of the quantity so obtained.

As the stocks of imported fertilisers are exceptionally low, we may take the following figures as being a safe estimate of the quantity used for wheat:—

	Tons.	Value.
Imported fertilisers—	21,200	£92,000
Local production—	3,400	£17,200
Total	24,600	£109,200

The value is the actual price paid by the users, and will not agree with the values shown in the Customs returns, which are practically wholesale prices at port of shipment, plus 10 per cent. In addition to the value as above, the farmer has to pay carriage by rail or boat, as well as cartage by road. This will average fully 7s. 6d. per ton extra; in fact, several of our large dealers told me that, based on their experience of the season, the average expense would be about 1s. to 1s 6d. per ton above this. Cartage at 7s. 6d. per ton on 24,600 tons equals £9,225, or a total cost for one season for manure of over £118,000.

Now let us inquire what this means to South Australia. The great majority of farmers use under 1cwt. of phosphatic fertilisers per acre; in very many cases 70lbs. to 84lbs. is all that is put on with the drill. If each ton of fertiliser used has been applied to only twenty acres, we have therefore 24,600 tons applied to, in round numbers, 500,000 acres This means as nearly as possible an outlay for the fertiliser alone of 5s. per acre, in addition to cost of drills, extra labor, &c., so that it will be seen that this comparatively new practice, as far as South Australia is concerned, is of immense importance to the well-being of the community. At present prices for wheat it means that 2½bush. per acre will be required to pay for the actual increase in outlay at seeding time, or a total of, say, 1,250,000bush. As the practice increases every year we cannot doubt that it is profitable, which would mean at the lowest an extra return on the average of 4bush. per acre, or a total of 2,000,000bush. This must result in a large increase in railway traffic and the public revenue, as a large proportion both of the fertiliser and the increased wheat yield is carried over the railways. Then there is the direct payment for extra labor involved and the indirect benefits derived from the circulation of so much money throughout the colony.

When the magnitude of the business in fertilisers, as shown by these figures, is considered it will be seen that it is absolutely necessary that users of fertilisers should be protected against fraud, and it was for this purpose that the Fertilisers Acts were enacted. If the farmer uses an inferior fertiliser he not only wastes the money paid for the manure, but also loses the result of his work in preparing and tilling the land for, in many cases, two years, as well as the extra crop he naturally expected to receive from the application of the fertiliser. It is therefore most important to the whole colony that fraud in the fertiliser trade should be prevented. During the past seven months I have visited all local works, except a few country bonemills, which only crush a few tons annually, and dispose of what they do not use themselves to their neighbors, who are generally in a position to know whether any adulteration is practised, and taken samples of the various fertilisers manufactured. Most of the factories have been visited three or four times, and, in addition, of about fifty-five vessels bringing fertilisers to this colony, I have obtained samples from all but five comparatively small lots, portions of shipments of same brand previously sampled. In all, seventy samples of imported fertilisers and fifty-four of local make were obtained and analysed by the Agricultural Analyst, the results being published in the *Journal of Agriculture* from month to month. With but few exceptions, the analyses showed that the fertilisers were what the vendors guaranteed them to be. Two or three samples of bonedust were found under the mark, and several lots of local mixed manures were of very inferior quality. In regard to this I would again call attention to the necessity of the purchaser obtaining from the seller his statement of the guaranteed analysis of the fertiliser sold by him before giving any order for the same. If growers would only take this simple precaution there would be much less risk of having an inferior article foisted upon them; but to order, as some of our gardeners do, 5cwts. or 10cwts. of super. to be made for them is simply placing themselves in the hands of the manufacturer.

The following particulars of the imports of fertilisers during the past five years, with Customs value, will be interesting for comparison:—

Year.	Bones and Bonedust. Tons.	Manure. Tons.	Total Value. £
1895	16	—*	670
1896	75	—*	2,790
1897	81	4,657	16,958
1898	244	12,532	38,019
1899	355	10,690	37,538
1900 (to end of May)	300	19,867	65,000

* Tonnage not available.

Next season will mark a new departure in the manure trade of this colony. The Adelaide Chemical Works will commence the manufacture of mineral super. at Port Adelaide from imported rock phosphate on a fairly large scale, while the Wallaroo Phosphate Company expect to make a start manufacturing mineral super. before the season closes.

ANALYSES OF COMMERCIAL FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following table gives particulars of analyses of samples of fertilisers obtained during May and June. This practically completes the season's work, and any readers wishing to know the analysis of almost any brand of fertiliser on the market can ascertain same by referring to the past six issues of the *Journal of Agriculture.* Statements of agents canvassing for orders for next season's supplies can easily be checked by a reference to these columns. A review of the season's operations appears elsewhere.

Name of Vendor.	Fertiliser.	Water Soluble Phosphate.	Citrate Soluble Phosphate.	Acid Soluble Phosphate.	Nitrogen.	Potash.
		°/o	°/o	°/o	°/o	°/o
C. F. H. Stockmann ..	Bonedust	—	—	47·15	4·02	—
E Anders	Victor Bonedust	—		45·62	4·30	—
Excelsior Manure Co. ..	Excelsior Bonedust	—	—	37·76	2·76	—
L. Conrad	Bonedust	—	—	48·46	3·57	—
L Mehrtens & Co.	Do.	—	—	40·82	4·3	—
Do. ..	Bone Manure	—	—	12·66	3·78	—
Do. ..	Bone Super.	13·30	13·31	5 24	—	—
Geo. Wills & Co. .... Clutterbuck Bros.	United Alkali Mineral Super.	37·55	—	—	—	—
E. & W. Hackett......	Ohlendorff's mineral super	36·02	—	—	—	—
Norman & Co.	Reliance Mineral Super.	36·67	—	—	—	—
F. H. Snow	Sheep Brand Mineral Super.	38·86	—	—	—	—
Gibbs, Bright, & Co. ..	Olendorff's Dissolved Peruvian Guano	20·85	—	12·33	5·01	1·99
A. W. Sandford & Co.	Kangaroo Brand Guano	—	—	50·43	—	—

MANURING OF POTATOES.

By W. L. Summers, Inspector of Fertilisers.

In the August, 1899, issue of the *Journal of Agriculture* I furnished particulars of experiments carried out in different parts with manures for potatoes, and showed how the formulæ which had given best results could be followed with the manures on the local market, and the cost of obtaining same. Having had some fertilisers offered me for experimental work with potatoes, three of the members of the Mount Compass Branch Bureau agreed to carry out systematic tests on the reclaimed peaty soils of that district under my instruction. I have to record my thanks to Messrs. F. H. Snow, Elder, Smith, & Co., A. W. Sandford & Co., A. R. B. Lucas & Co., and the Adelaide Chemical Works for supplying manures free of charge.

Each experimenter agreed to put in several plots, each one square chain in area, about the same day, using only one variety of potato, and giving each plot exactly the same treatment other than the fertilisers. In order to secure more uniform tests of the fertilisers, it was arranged that the land used for the tests should have been all treated alike in the way of cropping and manuring the previous season. It was confidently expected that the results of these tests would elicit much valuable information as to manures most profitable to use, a most important matter to the growers in this district in particular where the holdings, being comparatively small, it is essential that the best possible use should be made of the land. Unfortunately, however, the season turned out unfavorably and the results generally were very unsatisfactory.

The following gives particulars of results of the various tests—

MESSRS. WRIGHT BROS.' PLOTS.—Peaty land under cultivation for past six years; cropped last season with potatoes, and manured with bonedust. Plots each 1 sq. chain.

No. of Plot.	Fertiliser Applied.	Yield per Plot.		Yield per Acre.		Cost of Fertiliser per Acre.	Cost of Fertiliser above Check Plot.	Extra Yield per Acre of Marketable Potatoes over Check Plot.
		Marketable Potatoes.	Total Yield.	Total.	Marketable Potatoes.			
		lbs.	lbs	t. c. lbs.	t. c. lbs.	£ s. d.	£ s. d.	t. c. lbs.
Check	1cwt. bonedust	420	858	3 16 68	1 17 56	2 15 0	—	—
C	52lbs. mineral super., 20lbs. muriate potash, and 25lbs. nitrate soda	644	1,056	4 14 32	2 17 56	3 8 4	0 13 4	1 0 0
C1	46lbs. bonedust, 20lbs. muriate potash, and 20lbs nitrate soda ..	626	956	4 5 40	2 15 100	3 5 6	0 10 6	0 18 4
C3	56lbs. Kangaroo brand guano, 20lbs. muriate potash, 25lbs. nitrate soda	580	893	3 19 82	2 11 88	2 19 2	0 4 2	0 14 32
C4	46lbs. Bally bonedust, 20lbs. muriate potash, 20lbs. nitrate soda ..	532	772	3 8 104	2 7 56	3 5 6	0 10 6	0 13 0
C2	56lbs Thomas phosphate, 20lbs. muriate potash, 25lbs. nitrate soda	476	860	3 16 81				

Each of the plots, except the check plot, received as nearly as possible equal quantities of phosphoric acid, potash, and nitrogen, the formula adopted being one recommended by a prominent German authority as giving favorable results in that country. The formula works out to give as nearly as possible per acre— 95lbs. to 100lbs. phosphoric acid, 110lbs. potash, 40lbs. nitrogen per acre.

The object of this test was to show which form of phosphate gave the best return on the outlay when used in the proportion stated. It will be seen that water-soluble phosphate in the form of mineral super gave the *highest* increase over the test plot, but Kangaroo Brand guano gave the most ***profitable*** return, and bonedust next. In making a comparison between the different plots, it will be seen that for each 1s. spent on manure over and above the cost of the manure for the check plot—

Kangaroo Brand guano plot	gave	384lbs.	marketable potatoes extra
Bonedust (local)	"	196lbs.	"
Mineral super.	"	168lbs.	"
Bally bonedust	"	108lbs.	"
Thomas phosphate	"	60lbs.	"

The position of Bally bonedust is a surprise, and unexplainable. It was of higher grade than the local bonedust and finer, and naturally should have given a higher return. The returns were greatly affected by the season, and the proportion of small and seed potatoes was very high, especially in the check plot and the plot receiving Thomas phosphate. The proportion of small and seed potatoes in the various plots are—Check plot, 51 per cent.; C, 39 per cent.; C1, 35 per cent.; C3, 35 per cent.; C4, 31 per cent.; C2, 45 per cent.

Mr. M. Jacobs's Plots.—Plots, one square chain each, peaty land under cultivation for past four years, cropped last year with potatoes, bonedust being used. Plots were planted with Elephant potatoes at rate of 12cwts. per acre.

No. of Plot.	Fertiliser Applied.	Yield per Plot.		Yield per Acre.		Cost of Fertiliser per Acre.	Cost of Fertiliser above Check Plot.
		Marketable Potatoes.	Total Yield.	Total.	Marketable Potatoes.		
		lbs.	lbs.	t. c. lbs.	t. c. lbs.	£ s. d.	£ s. d.
Check	1cwt. bonedust	1,064	1,316	5 17 56	4 15 0	2 15 0	—
C1	45lbs. Kangaroo brand guano, 20lbs. sulphate of potash, 25lbs. nitrate of soda	1,036	1,288	5 15 0	4 12 56	3 0 0	0 5 0
C	52lbs. mineral super., 20lbs. muriate potash, 25lbs. nitrate soda ..	1,036	1,288	5 15 0	4 12 56	3 8 4	0 13 4
B	35lbs. Thomas phosphate, 20lbs. sulphate potash, 20lbs. nitrate soda	952	1,176	5 5 0	4 5 0	3 4 2	0 9 2
A	60lbs. super., 15lbs. muriate potash, 25lbs. nitrate soda	812	1,008	4 10 0	3 12 56	3 7 6	0 12 6
A1	56lbs. Thomas phosphate, 15lbs. muriate potash, 25lbs. nitrate soda	728	924	4 2 56	3 5 0	3 0 0	0 5 0

The intention in this series of plots was to obtain results for comparison with the other two series, and also to test three (A, B, C) different formulæ against one another. The results are, however, so contradictory as to make it impossible to draw any satisfactory conclusions therefrom. In the first case the yields altogether are much higher than in the previous test, though still below a good crop for this locality.. Then the check plot, where only bonedust was used, gives a better return by 2¼cwts. per acre of marketable potatoes than the best of the other plots, a result altogether contrary to expectations. The previous cropping and manuring cannot have affected the result, as it was the same in each case. Mr. Jacobs puts the unsatisfactory results down to the bad season. The potatoes were planted on October 25, and were cut down twice by frost in November and harvested at end of February. It is quite possible that the different plots were affected to a varying extent by the frost. Mr. Jacobs states that he intends to put the same plots in again next season without manure, as he is confident most of the plant food was left in the soil. The favorable position of Kangaroo Brand guano is worthy of note, as it is the cheapest form of phosphate on the market.

Mr. H. McKinlay's Plots.—Land drained and cleared for three years and hoed up roughly twelve months before planting. First crop on land. Beauty of Hebron potatoes planted in November, harvested in June, though fit to dig in May. The crop was very promising until cut down by black spot. Plots one square chain.

Plot.	Manured with	Yield per Plot.		Yield per Acre.		Cost of Manure per Acre.	Extra Cost of Manure over Check Plot.	Extra Return of Marketable Potatoes over Check Plot.
		Marketable Potatoes.	Total.	Total.	Marketable Potatoes.			
		lbs.	lbs.	t. c. lbs.	t. c. lbs.	£ s. d.	£ s. d.	t. c. lbs.
Check	1cwt. bonedust	616	840	3 15 0	2 15 0	2 15 0	—	—
A 1	45lbs. bonedust, 15lbs. muriate potash, 25lbs. nitrate soda	1,568	1,736	7 15 0	7 0 0	3 17 6	1 2 6	4 5 0
A	60lbs. super., 15lbs. muriate potash, 25lbs. nitrate soda	1,400	1,540	6 17 56	6 5 0	3 17 0	1 2 0	3 10 0
A2	56lbs. Kangaroo brand guano, 15lbs. muriate potash, 25lbs nitrate soda	1,120	1,288	5 15 0	5 0 0	3 6 0	0 11 0	2 5 0
A3	56lbs. Thomas phosphate, 15lbs. muriate potash, 25lbs. nitrate soda	840	1,036	4 12 56	3 15 0	3 10 0	0 15 0	1 0 0
Check	Potato manure	560	756	3 7 56	2 10 0	1 17 6	—	—

The purpose of this series of plots was to test the formula found most successful in Georgia experiments, using the same quantities of muriate of potash and nitrate of soda, and varying quantities of the different phosphates, so as to give in each case the same amount of phosphoric acid. It was, of course, also expected to be able to make a fair comparison of the results from the three series of plots, but as before stated this cannot be done. The potato manure used was a local formula containing 21 per cent. nitrogen, 5 per cent. potash, 15 per cent. water soluble phosphate, and 9 per cent. phosphate soluble in citrate of ammonia and acid; but the dressing was too light, results comparing unfavorably with all except the check plot of bonedust. Comparing the results, the plot with bonedust in addition to the nitrate and muriate gives the highest return, the super plot next, and the guano next. When, however, the price is taken into consideration, the best position is again taken by the Kangaroo brand guano, as on this plot, for every 1s. spent for manure over and above the cost of bonedust used on check plot, 458lbs. marketable potatoes were obtained; on the bonedust plot, 423lbs.; super, 356lbs; and Thomas phosphate, 149lbs. The results of this series of tests are very profitable, in fact the only profitable one of the three.

Making a general comparison of results, it will be seen that Kangaroo brand guano right through is very satisfactory. This was expected on these peaty soils, containing a considerable proportion of decomposed vegetable matter and a fair supply of moisture. Favorable results were also expected from the use of Thomas phosphate, but these expectations have not been fulfilled, the returns in every case being unsatisfactory. On the average, too, it would appear that there is little difference between the returns from high grade bonedust and from mineral super.

Growers in other districts must bear in mind, when making comparisons with their own experiences, that the character of the soil will largely affect the question as to which form of phosphate will pay best. In light soils, or in drier districts, or when the growing period of the crop is shorter, better results will probably be obtained from use of super. or finely-ground bonedust than from guano or Thomas Phosphate; still the very favorable returns from the use of the guano in these experiments should encourage growers to experiment with it, as it is undoubtedly the cheapest form of phosphate on the market.

SULPHATE AND MURIATE OF POTASH FOR POTATOES.

The Connecticut Experiment Station made experiments to compare the effect of muriate with that of sulphate of potash on the starch content and yield of tubers. The potatoes were grown on very poor soil, which was dressed with 400lbs. nitrate soda, 615lbs. acid phosphate, and 120lbs. of muriate or sulphate of potash. The yield was increased from 43bush. to 228bush. of saleable tubers per acre. Doubling the potash, applying 240lbs. per acre, increased the yield only 12bush. per acre over what was produced when 120lbs. were applied. Muriate produced a somewhat greater yield than sulphate, but the tubers contained slightly more water and less starch than when sulphate was used. The evidence in regard to the relative effect of sulphate and muriate of potash on potatoes is somewhat conflicting. Most of the experiments made in Europe show that sulphate produces better tubers with less water and a slightly higher starch content, but the difference is slight. Some German experimenters, Pfeiffer and others, have recently published results of experiments showing that pure muriate has no injurious effect on the tubers, but impurities, noticeably chloride of magnesia, are influential in depressing the proportion of starch.

The muriate of potash sold in Adelaide is guaranteed 97 per cent. of purity, and contains from 55 per cent. to 60 per cent. pure potash, so that there is not so much danger of injury from the impurities referred to. A strong point in favor of the muriate is that 1lb. of potash in muriate costs about 2d., as compared with 3d. in sulphate of potash, and, being more concentrated, the cost of carriage is proportionately less.

FUNGUS DISEASES AND INSECT PESTS.

Causes of failure in treatment of fungus diseases and insect pests are due in most cases to misapplication of the remedies. No one goes fishing with a shot gun, nor does he go bird hunting with a fish-hook. Yet some horticulturists go out "bug-killing" with fungicides, and try to kill fungus parasites with Paris green and other insecticides. Some insects live by sucking the vital juices from the interior parts of leaves, fruit, or bark, or bore into the substance of the fruit, or leaves, or wood, and when this is the case the application of substances which kill by contact alone or by poisoning the surface of their food is of no use whatever.

The spores of "shothole," "scab," and "curl-leaf" can be destroyed with Bordeaux mixture when the buds of the affected plant begin to open; but if secondary spores are produced whilst the trees are in leaf they can be prevented in injuring the leaves and fruit if the tree is kept covered with a film of Bordeaux mixture. If rain should fall soon after any application of this fungicide the spraying must be repeated. There are some parasitic fungi which exist on the surface of leaves and fruit—such as Oïdium Tuckerii—and these can be destroyed by the fumes of flowers of sulphur applied by sprinkling when the open-air temperature is over 80°F. in the shade.

Some insect pests eat leaves or fruit, or both leaves and fruit; others only suck out the vital juices. Gnawing insects may be killed by application of poisons sufficiently strong to kill them, but having no effect upon larger animals. Arsenite of lime and Paris green are the principal poisons used for this purpose. If applied directly the fruits begin to form on apple, pear, and quince trees (provided rain does not wash it off), either of those poisons will destroy nearly all the first brood of codlin moth caterpillars. Not more than 16ozs. pure Paris green or arsenite of lime should be used in 200galls. of water for spraying. Never spray trees when in flower, nor whilst the sunshine is very hot. The same poisons will destroy insects which eat the leaves or gnaw holes in fruit or bark, but when they get beneath the surface no poisons applied outside can affect them. Borers can be destroyed by putting a plug of anything saturated with bisulphide of carbon in the hole, and then stopping it up with putty or any solid substance.

All insects can be killed by damping them with some oily substance that will stop up their spiracles, or air-absorbing channels—such as kerosine emulsion, resin compound, soap, &c.—but many insects are so protected that it is difficult to get these substances into direct contact with these spiracles. Plant lice and some scale insects and soft-bodied insects are readily subject to sprays. The most effective agent for destruction of all kinds of insects is the hydrocyanic gas treatment, but skilled labor and a rather costly set of tents and derricks is required for its application.

Aphides of various species live as well upon the roots of vines, apple trees, peach trees, orange trees, &c. A strong decoction of tobacco and dissolved soap applied to the roots near the trunk and sprayed upon the branches just before the sap begins to rise is regarded as a perfect remedy. Fumigation under a close tent with tobacco smoke will afford temporary relief, and it has been asserted that liberal doses of fresh wood ashes or of soot, or even of flowers of sulphur, at the roots will kill the insects and stimulate growth on the trees.

Red spider, thrips, &c., may be attacked in the dormant season with lime, salt, and sulphur; or with flowers of sulphur or hydrocyanic acid gas whilst the trees are in active growth.

Some insect pests require special precautions and treatment. Night-feeding caterpillars, which bury in the soil during daylight, may be poisoned wholesale with pellets of a mixture of 30lbs. bran or pollard, 4lbs. coarse brown sugar or molasses, 1lb. Paris green, with enough water to make a stiff paste. This is also very effective against locusts whilst in their wingless stage. Eelworms, which injure roots of cereals and bulbs of onions, &c., can only be combated by growing crops which they do not attack. Grubs, caterpillars, and perfect insects of several kinds can only be dealt with on systems so expensive and troublesome that the results attained will not justify the cost. Natural agencies must be left to operate in such cases- such as birds, bare fallows for two or even three years, cultivation of crops which are unsuitable for their sustenance, and other measures, according to the special nature of the affliction—such as wholesale trapping in trenches, or by lights at night set in vessels of water with kerosene floating on the surface, or by ploughing, rolling, squashing with bushed harrows, liming, broadcast spraying, &c.

PECCAN NUTS.

By M. Holtze, Curator Botanic Garden.

Peccan nuts are the fruits of one of the Hickory trees of North America. The botanical name of the tree is Carya olivæformis, which can be translated as olive-shaped walnut, Caryon being the Greek name of the walnut. The Peccan nut is in North America considered to be even superior to any other Hickory or Walnut, and is consumed in great quantities. Some days as many as six to eight railway-car loads are imported into New York. The home of the Peccan nut is Louisiana and Texas, and it grows well in the Southern States. In good soil the tree attains a height of 70ft., and brings a crop of 4cwts. of nuts. The latter are of the size of a small walnut, with a sweet, nutritious kernel, containing a sweet oil. The tree has been in the last few years extensively planted in the United States, and superior varieties have been raised by selection of the best nuts for sowing. Those varieties can be propagated by grafting on the common wild stock. This is, however, not quite easy, as, like the Walnut tree, the Peccan nut does not kindly take to this operation. This best method of propagation of those trees (besides by seed) is to lay bare the roots round the tree at a distance for 2ft. to 3ft. (or more for older trees) from the stem, and to partially wound the bark. From those places the roots will make suckers, which can be removed when they have made sufficient roots to be transplanted. New sorts may also be budded on the wild stock by taking a ring of bark, about an inch or two wide, containing an eye round a shoot from the scion and lay it on to the stock, where a like ring of bark has been removed. The joint should be made as accurate as possible, and the wound covered with grafting wax. The same little-known method of propagation, it may be here remarked, can also be used successfully with Walnuts and Chestnuts.

The Peccan nut will grow best in a soil containing sufficient moisture, without, however, being too wet. The sides of watercourses in the hills will do very well for this tree, even when stony and not fit for other cultivation, so long as the soil is not too poor, as little cultivation will be sufficient. So far not much has been done here to cultivate this valuable tree, but there is no reason why it should not do well. It comes from a country warmer than the native home of the Walnut, which does very well here; the young trees at the Typical Orchard planted last year are doing well, and a kindred tree, the White Hickory nut, Carya alba, grows well at Mount Barker. This species of Hickory nut, together with Carya sulcata, the ribbed Hickory nut, gives also good edible nuts, although they are not equal to the Peccan nut. Carya porcina gives the best hickory wood, and might, therefore, also be tried in suitable localities. Those three latter species come, however, from a colder part of North America, and will do best in the cooler parts of our hills. The best way to start the cultivation of those trees will be to import the nuts from North America, where they are obtainable through nurserymen, and rear them in seedbeds. The young plants should then be transplanted, when a year old, without injuring the tap roots, on the places they will occupy, and should not be pruned unless it be to remove the lower branches if it is desirable to grow them with a high stem. The only cultivation they will require is to keep the ground around them free from weeds and stirred up occasionally. As before mentioned, they will do very well in odd corners as long as the soil is fairly rich and moist, and if it is desired to plant them in an orchard each tree requires to be planted at least 30ft. from is neighbors. The trees will come into bearing after about ten years; and in North America a tree twenty years old is supposed to yield from 10bush. upward. The trees will last for more than a lifetime.

ALKALINE SOILS.

There are many places in Australia where, as a consequence of irrigation on arid country, an alkaline efflorescence has been promoted, and consequently the cultivated trees and plants have either been killed outright or their vitality and luxuriance very considerably diminished. In the various irrigated areas of California a great amount of injury has resulted from the same cause. As a consequence of this a searching investigation into the causes of the trouble and possible remedies was instituted by the scientific officials of the United States Department of Agriculture. Many reports have been furnished from time to time, and one of the latest, by Professor E. W. Hilgard, Director of the Agricultural Experiment Station, University of California, has just reached our hands. It is entitled "Nature, Value, and Utilisation of Alkali Lands." The first part of this report deals with the origin and nature of the salts which cause the damage, which, it is now well known, are characteristic of all country where there is scarcely any rainfall. The "alkali" is dissolved by the moderate quantity of water reaching the soil; the moisture is attracted to the surface by capillary action and heat; the water is evaporated. and the salts are left near or upon the surface. In country where there is an annual rainfall of over 20in. the dissolved salts are carried away to a considerable extent by seepage; but in arid countries they remain and increase because the water does not flow away with the dissolved salts, but simply evaporates, leaving the dissolved matter near the surface.

It has been proved that the great bulk of the alkali remains near the surface, and within the depth to which the moisture usually penetrates. Below a certain depth, say, 3ft., the soil contains very little of the salts, and is perfectly healthy for plant life. In many cases the bulk of the salts is much nearer the surface, and plants which have become "established"—that is having penetrated by their roots through the thin stratum of alkali soil—are enabled to thrive.

Experiments have been conducted in flooding alkali lands with the object of dissolving the salts and carrying the alkali away, but this failed, as it was found, in addition to several other disadvantages, that the water dissolved and carried off the beneficial salts that are necessary to plant life, as well as the alkali which is detrimental to the existence of plants. Much of the "black alkali" is driven before the water into the subsoil, when the land is irrigated, and remains there for a time, but comes again to the surface when favorable conditions prevail. When irrigation is resorted to the salts are dissolved in greater quantity, and with greater rapidity are brought near the surface and left there upon the evaporation of the moisture; this is especially the case in the vicinity of defective water channels.

Black alkali and white alkali are described and dealt with in full in the report; but there is no necessity here to refer further to their distinctive features, except to state that black alkali (carbonate of soda) is the most difficult to deal with and the most deadly to plant life.

It has been proved that in many cases the chief bulk of the alkali becomes collected within 3in or 4in. of the surface, and it would be possible to remove much of it by scraping from the affected land. Of course this means a great deal of labor. Another method of dealing with the evil is by trenching and throwing the top layer of alkali-infected soil to the bottom. This allows of a few successive crops being raised, but ultimately the salts again reach the surface. By covering the surface with a thick mulch of leaves and other light rubbish the soil can be shaded, and capillary attraction thereby arrested, so that the salts remain diffused throughout the mass of soil and their virulence is modified. A similar effect can be produced more readily, and much more cheaply, by continually loosening the surface layer of soil to a depth of 4in. Trees which are densely covered with foliage and have spreading branches afford a somewhat similar protection. It is remarkable that the principal cause of injury to trees consists of a corrosion of the bark of stems and roots near the surface, and that when the roots, in any but black alkaline soils, reach to a depth below the upper stratum the plant thrives in many cases, but not always.

Alkaline lands can be utilised, where not too heavily charged, by the cultivation of crop not too susceptible to the influence of the various salts. First amongst such plants is the Australian saltbush (Atriplex semibaccata), closely followed by two or three other varieties, and supplemented by our Australian "buck-bush" (Salsola kali), and a number of useful salsolaceous plants, indigenous and exotic. As these plants take out a very considerable portion of the injurious salts, it is suggested that in time the soil could be relieved sufficiently to allow of the cultivation of crops which cannot at first be grown there.

The tolerance by certain plants of the presence of carbonate of soda, sulphate of soda, glauber salts, &c., varies according to the nature of the soil, whether sandy or clay. For clay soils the tolerance is most decidedly the least. Gypsum is, without doubt, the cheapest and most effective agent in reducing the virulence of carbonate of soda, provided water is also present. The amount to be used must depend upon the percentage or quantity of carbonate of soda present in the soil. For the complete neutralisation of each 1,000lbs. of carbonate of soda present in the land 1,630lbs. of pure gypsum is required. This quantity, however, may not be needed all at once, as a considerable portion of the alkali may be contained in the lower strata, and will not come within the reach of the roots of the plants until brought up by capillarity to the surface. The white alkali (sulphate of soda) is not nearly so detrimental as is carbonate of soda to the well-being of plants, and the surface soil may be encrusted with it whilst a luxuriant cereal crop still continues to grow.

Sub-drainage is another effective though expensive method of reclaiming bad alkali lands where black alkali is not present in excessive quantity. In such a case a previous heavy dressing with gypsum is essentially necessary. The report states—

> It is not practicable, as many suppose, to wash the salts off the surface by a rush of water, as they instantly soak into the ground at the first touch. Nor is there any sensible relief from allowing the water to stand on the land and then drawing it off, as in this case also the salts soak down ahead of the water, and the water standing on the surface remains almost unchanged. In very pervious soils, and in the case of white alkali, the washing-out can often be accomplished without special provision by underdrainage, by leaving the water on the land sufficiently long. But the laying of underdrains greatly accelerates the work, and renders success certain. An important exception, however, occurs in the case of black alkali in most lands. In this case either the impervious hardpan or (in the case of actual alkali spots) the impenetrability of the surface soil itself will render even underdrains ineffective unless the salsoda (carbonate of soda) and its effects on the soil are first destroyed by the use of gypsum. This is not only necessary in order to render proper drainage and leaching possible, but is also advisable in order to prevent the leaching-out of the valuable humus and soluble phosphates, which are rendered insoluble (but not unavailable to plants) by the action of the gypsum. Wherever black alkali is found, therefore the application of gypsum should precede any and all other efforts toward reclamation.

In reference to reclamation of alkali lands by cropping with plants which take up considerable amounts of salts, it is advisable to remove from the land the salt growths that may naturally cover it, and, if possible, also the crops grown.

WHY WEEDS ARE INJURIOUS.

When Adam left the Garden of Eden he was told that he would have to fight against weeds, and his descendants have continued the battle, more or less vigorously, until the present day. A "weed" is "any plant out of place," and, according to that definition, a wheat plant in a field of peas would be a "weed," in the same way that a plant of charlock would be a weed in a field of wheat.

Nearly all weeds do some injury, and some of them are extremely injurious to cultivated crops. This injury is greater or lesser according to the number of weeds.

It is almost invariably the case that weeds thrive more than the cultivated crops amongst which they are found, probably because they cannot compete so successfully with plants of an allied nature as they can with those of an opposite character.

The injuries inflicted by weeds are produced in various ways, for instance:—

They absorb Soil Moisture.—A drumhead cabbage will absorb from the soil and transpire upon the air over a quart of water each twenty-four hours; an ordinary mustard plant takes up 14ozs. of water per day—an acre of such plants would take up over 7,000galls. per week. Thin-leaved plants transpire more than those having succulent leaves. As a consequence, every weed amongst a crop takes up a deal of moisture that is urgently wanted by the adjacent plants that are being cultivated for profit. This is a very serious item in a dry climate such as ours.

Weeds use Plant Food which ought to be reserved for use of the cultivated crops. To grow a good plant of charlock—or any other weed—amongst a cultivated crop means the loss of sustenance for at least four adjacent plants.

They occupy Space in the field which could be profitably filled by an economic plant or a cultivated plant, and shade, crowd, and choke the proper crops of the field.

They increase the cost of cultivating any crops, and when allowed to seed they provide no end of trouble for succeeding years, besides fouling the seed of the crop that has been cultivated.

The presence of stinkwort, charlock, thistles, and other strong tall weeds interferes seriously with the working of string-binders, mowers, strippers, and other harvesting implements.

If one-fourth of the plants growing on a field are weeds instead of, say, wheat, barley, or oats, it is safe to estimate that the crop of cereals will be reduced two-thirds by their presence.

TRANSPLANTING ONIONS.

At the Idaho Agricultural Experiment Station some interesting experiments have been carried out to test the relative yields of different varieties of onions when the plants are raised in beds and transplanted as compared with open ground seeding. In the one case the plants were raised in a hot bed until they averaged less than ¼in. in diameter, and then were transplanted in the open ground in rows 12in. apart and with about 6in between the plants. On the date of transplanting other rows were seeded in the open, the whole of the plots being on soil of the same nature. It was intended to thin out the seeded rows to 6in. apart, but it was found that considerably less than this distance was sufficient, the consequence being they were left much closer. All the rows received the same care and cultivation except at the thinning operations. The following shows the result of the experiment:—

Transplanted Onions.

Variety.	Pounds Weight in 100ft. of Row.	Number of Bulbs per Row.	Yield per Acre—Bushels.
Prizetaker	180	200	1,393
Wethersfield	120	206	928
Yellow Globe Danvers	104	203	805
Australian Brown	80	200	619
Sown in Open Ground.			
Prizetaker	170	520	1,316
Wethersfield	90	480	696
Yellow Globe Danvers	120	486	928
Australian Brown	74	432	571

The results, with the exception of the Yellow Globe, are decidedly in favor of transplanting. It is a moot point as to what extent the yield was affected owing to the transplanted onions being really several weeks earlier than the others. In a climate like ours in South Australia it is possible that the results would be very different. Labor involved in transplanting has to be taken into account, but against this is the fact that the attention required in the earlier stages of growth would be lessened when the onions are raised in beds; hot beds would scarcely be necessary here In California it is stated that for the early crop transplanting is largely depended upon, and is followed with profit.

Water for Cows.—Cows are very eccentric as to their drinking habits. Some are naturally big drinkers and some are small drinkers, and it is doubtful if there are any large milkers that are not large drinkers. Some who have experimented with cows as to their drinking habits assert that they vary greatly as to the time when they want this water. Some prefer to drink enough at one time to satisfy them for twenty-four hours, while other cows want to drink often. It is a good idea to have drinking arrangements such that the cows can suit themselves as to the time of drinking.

FARM HINTS FOR JULY.

By The Editor.

Anyone who has had to stand about at night in the open air for an hour or two lately will be able to appreciate what sufferings through cold must be endured by farm stock without any suitable protection. In the case of young lambs especially, and of young stock generally, it is cruel to allow them to be so exposed. A hedge would be better than nothing, but there are many farms where a wire fence is the best shelter afforded for the farm live stock.

In some cases farmers have been too economical in the use of super., and now note that their crops do not look so luxuriant as those of neighbors who have been more liberal. The evil may be remedied to a considerable extent by giving a top dressing of super., and this might be followed advantageously with a light top dressing of sulphate of ammonia, especially for hay crops. In the use of super. it is far more profitable to apply 2cwts. than to put on only 70lbs.

If any crop appears to be too luxuriant, or "winter proud," it should be either fed down by sheep or be rolled when the weather is fine and warm and the soil mellow. After this light harrows should be run over the crop during fine weather.

In summer, autumn, and early winter there is always a scarcity of succulent fodder for live stock, unless the owner either grows special crops (which is not always practicable) or provides a good bit of silage (which can almost always be done). Without a fair quantity of such fodder it is next to impossible to keep stock in good healthy condition; but with plenty of green feed, or lots of silage, diseases of many kinds can be kept away from the farm, the stock will be sleek, strong, and profitable. Cows cannot keep up a full supply of rich milk upon dry herbage. Pit silage is best for cows, and once a silo is constructed it will last for very many years.

Grass paddocks must be allowed to produce seeds for regeneration of the herbage. In order to allow of this, it is necessary to cultivate some land with forage crops. As the present is a good season in some parts, it is desirable that a portion of the fallowed land shall be prepared for growth of maize, holcus, sorghum, kale, or any other crop that can be used to relieve the grass paddocks.

"All work and no play" is as bad for the old people as it is for the youngsters. It is quite hopeless to look for the time of year when there is nothing to do upon the farm; but a spell must be taken when there is least requiring to be finished. After such a rest all hands return with renewed vigor and pleasure to their labor, and probably more work will be done than if they had all continued toiling on. These remarks apply as well to the women folk as to the male sex.

Never leave until to-morrow that which can be done to-day. The man who neglects this will have his work always driving him, instead of driving his work before him, and at some time having plenty of leisure.

Where there are market gardens close by the farmer may be excused from growing fruit and vegetables, but where dependence has to be placed upon hawkers or stores, retailing stale produce that has been mauled over by no one knows who, he must attempt to grow something fit for his people to use. With the aid of the plough and harrows he can work deeply and thoroughly pulverise half an acre at least, and can surely spare enough manure to fertilise it. Even if he cannot produce exhibition fruit and vegetables, he can grow many things that will be fresher and cleaner than the wilted refuse of a hundred previous customers of the hawker or shopkeeper.

The dung midden should be roofed over, else the water falling on the manure and flowing away will carry off the major portion of the soluble constituents of the fertiliser.

To enrich land in nitrogenous matters would be very costly if one has to go to the merchant for his fertiliser; but scientific experimentalists have conclusively proved that this most costly article can be obtained from the air in large quantities with the aid of leguminous plants, such as peas, beans, clovers, &c., the roots of which give a home to certain forms or bacteria which make nodules on the roots in which they live, and there collect nitrogen from the air. By growing peas, beans, or other leguminosæ, the land is therefore enriched, and the live stock also kept in good condition. In land very poor in nitrogen such plants grow very slowly at first. To remedy this a little rich surface soil can be distributed over the fields when the plants start into rapid growth, owing to the bacteria which are introduced along with the rich soil.

In the hilly districts and cool parts of the colony, peas, beans, vetches, tares, clovers, trefoils, lucern, kale, rape, mustard, and many other crops can be sown during this and next two months. If there are not enough of animals to eat the crops off the land, they can be ploughed under as green manure or harvested either as silage or hay. A mixture of many nutritious plants, such as above, makes a palatable and profitable fodder for all kinds of live stock.

Implements should be cleaned, oiled, painted (if necessary), put into perfect repair at once, and placed under shelter directly they are done with for the time. Attention to these items will save loss of time, loss of cash, and preserve good temper.

Prepare land by heavy manuring and tillage for sowing with beets and mangolds during August and September. For shallow land the Globe and Orange Mangolds and Sugar Beets are best suited. For deep rich alluviums the larger kinds should be sown, in drills at 30in. apart, with 12in. to 16in. between the plants. As there are two or more seeds in each capsule, the plants must afterwards be singled, and the hoe must be kept going to destroy weeds, and also to keep the soil well aerated.

Tree-planting is an item well worthy of attention during this and the next two months, according to earliness or lateness of season in each particular locality. Timber and firewood will be of considerable value in many localities in the near future, and it is the duty of every occupier of land to look to the interests of those who come afterwards. Land covered with trees advances in value every year.

Carrots and parsnips should be sown in drills 18in. apart, thinned to 8in., and frequently cultivated. Carrots are useful especially for horses, and both roots are valuable for milking cows.

Potatoes should be planted in warm, loose, rich soils in drills 30in. by 12in., and 4in. to 6in. deep. Do not hill them up, but keep the soil fairly loose all the time the plants are growing.

Sow mustard, turnips, sunflowers, all sorts of cattle cabbage and kale, chicory, and any kinds of fodder plants. Chicory should be sown next month.

"DOCTORING" HORSES.

Were it not for the pity engendered for the poor animals that are subjected to such treatment, it would be intensely amusing to read of the "remedies" that are reported, but not always published, as having been successfully, or otherwise, adopted for the cure of various complaints supposed to have been suffered by the horses owned by different persons. These clever "horse doctors" first of all guess at the nature of the disease, and then experiment upon the constitution of the animal by administering the handiest nasty mixture they can get hold of. If these things were as innocent as Wackford Squeers' brimstone and treacle their nastiness would not so much matter; but when a decoction of tobacco mixed with Epsom salts and kerosine is administered to a horse, it is almost bad enough to make him do the impossible, and throw it up again. "As sick as a horse" is a common saying, but no horse can vomit; therefore the filthy messes entail prolonged suffering, and intensify the distress of the poor wretch. Even if the horse is in the enjoyment of perfect health, some owners feel that they must regularly dose him in order to maintain that happy condition. Tonics and condition powders are considered by such persons to be essential to the wellbeing of their horses. Suitable food, clean water, good shelter, and clean quarters are of little importance to such persons, when compared with the virtues of sulphur, copperas, linseed oil, turpentine, tobacco, Epsom salts, aloes, and kerosine. Quacks and charlatans find ready listeners in such people whilst lauding their nostrums, warranted to prevent or cure all the evils to which horses are or may be subject; but the money spent on these drugs and chemicals. combined with the losses brought about by their use, would go a long way towards providing the horses with comfortable quarters, good food and water, and everything that would naturally tend to the maintenance of robust health and good condition.

Slight attacks of illness will generally pass away when the animal is allowed to rest quietly and is supplied with nourishing food. Medicines, including "tonics" and "condition powders," should never be administered without a complete knowledge of the complaint from which the horse is suffering, as well as of the effects that will follow the exhibition of the supposed remedy. As a rule, all drugs or medicines are dangerous, but they are far more dangerous when wrongly administered. In serious cases of illness it is necessary, of course, to use medicines, and to submit the animal to special treatment and care; but all this may do more harm than good if the "doctor" does not thoroughly understand what is the matter with the horse, and knows exactly what medicines are required and what treatment should be followed. Such troubles as colic, cramp, constipation, and other simple complaints may be successfully dealt with by an intelligent owner who has had a fair experience amongst horses; but it is barbarous to attempt to deal with unknown diseases by administering filthy and drastic compounds such as are often recommended by quacks, whose ignorance of the diseases and remedies is only equalled by their gorgeous assumption of profound veterinary knowledge.

PRODUCE EXPORT DEPARTMENT.

By the Manager.

Rabbits.—During the month of June the following rabbits and hares have been received for treatment:—Eight thousand two hundred and twelve crates, containing 203,838 rabbits; three crates, containing forty-eight hares. The total number of rabbits treated for the present season is 24,856 crates, containing 619,706 rabbits.

Wine.—The only shipment for the month was 3,369galls. in the *Warrigal*, which sailed on the 1st inst.

Oranges.—The first of this season's orange shipments was made in the *Ophir*, on the 28th inst., which had on board seventy-eight cases.

Freight at 45s. per ton measurement, per mail steamers, can now be secured in boats sailing on the 12th and 26th July, Aug 9th and 23rd.

Last season's sales in London averaged 14s. 4d. a case, and I would strongly recommend growers with surplus stock to try the London market, pointing out that the department made the best sales last year.

WINE AND CELLAR NOTES.

By Arthur J. Perkins, Government Viticulturist.

The cold weather that has prevailed during the past month should have done much towards hastening the brightening of young wines. Towards the end of July in many districts the average temperature will tend to rise, and preparations should be made for the second racking. Great care should be taken over this operation, in view of the fact that no wine should be allowed to enter September in a dull cloudy state.

The present month should prove favorable to fining; and advantage should be taken of it for all wines that in any way require it. Let it be remembered that perfect effects can only be obtained from this operation when the wine is at a comparatively low temperature. As much as possible, therefore, all fining should be carried out during the winter months.

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Our so-called temperance societies can say nothing that is good of the fermented juice of the grape. Such, however, is not the opinion of the French War Office, who, acting under advice of the highest medical authority, have recently issued the following instructions to military authorities:

"In order to protect men under their command from the dangers of alcoholism, some military officers have latterly on their own initiative issued certain orders as to the consumption of alcoholic beverages in the barracks. In some cases the sale of spirits and liqueurs has simply been prohibited during certain hours of the day; in others the sale of alcoholic beverages has been restricted to a selected list; in others, again, the sale of all alcoholic beverages has been absolutely prohibited.

"From the point of view of hygiene and discipline it is necessary that these differences in practice should cease, that there should be some uniformity in the treatment of alcoholism, and that the whole army should be made to benefit by a treatment that cannot be restricted to limited bodies of men.

"In consequence I have determined to absolutely prohibit the sale within the military canteens of any spirit, or any liqueur containing alcohol, or any of the numerous beverages going by the name of *aperitifs*. This prohibition will affect all canteens within barracks, quarters, camps, or manœuvre grounds.

"*Alone* is allowed within these canteens the sale of *fermented beverages—wine*, beer, cider, perry, and that of other ordinary beverages (coffee, tea, milk, chocolate, &c.) that do not contain alcohol."

It will be seen that the use of spirits is proscribed, but not that of wines, &c. Will our temperance societies please note?

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The stocks of wine in the colony are at present undoubtedly low, and it is satisfactory to know that London buyers are buying up large parcels at higher rates than have hitherto obtained. Many makers are anxiously awaiting the advent of federation and intercolonial free-trade. At the outset it will no doubt do much for our local wine trade. To abandon the London trade, that has taken so many years to build up, in favor of a temporarily extended local trade, would argue much want of forethought. Local requirements will soon be caught up, and, once disappointed, London will be chary of dealing with us again. It would only mean a repetition of Cape experience, from which it is to be hoped we may be saved. Let us certainly take advantage of the new intercolonial markets, but let us not drop London. The buoyancy of trade will lead to more planting, and with a return of good seasons we shall be able to keep both going.

In these notes I propose giving from time to time the analyses of samples of wines sent to me from the London wine depôt. Where necessary special comment will be made on the results, but in all cases the wines will only be referred to by special reference numbers.

Reference number	226	227	228	229
Specific gravity	·993	·973	·994	·995
Alcohol in volume (per cent.)	13·4	13·6	13·8	14·1
Total acidity in grams per litre as H_2SO_4	4·6	4·025	4·823	3·99
Fixed acidity in grams per litre as H_2SO_4	3·7	3·22	3·858	3·16
Volatile acidity in grams per litre as $C_2H_4O_2$	·854	·982	1·177	1·01
Dry residue in grams per litre	30·675	29·5	29·2	28·55
Ash in grams per litre	—	3·175	3·150	3·375
Cream of tartar in grams per litre	—	2·362	3·82	2·302

All the above wines were of the full-bodied dry red type. The most noteworthy feature in the above figures is the relatively high percentage of volatile acids; it should not as a rule exceed 1 gram per litre, and the nearer ½ gram the better.

The above analyses were carried out in my laboratory by Mr. H. E. Laffer.

THE VINEYARD.

SEASONABLE NOTES.

By Arthur J. Perkins, Government Viticulturist.

As soon as the land has somewhat recovered from the severe soaking of the past month the first ploughing should be pushed on with vigor; it should be completed in July, so that second ploughing may be started before the buds begin to swell. It is to be hoped that the heavy rains with which we have latterly been favored did not find the soil totally untilled, and that some portion of the moisture was able to penetrate far into the subsoil.

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The renewed interest that is being taken in pruning matches is only a sign of the times. On all sides confidence is finding its way back to tillers of the soil, and to vinegrowers in particular; let us therefore welcome the pruning matches that appeared to be dying a natural death a year or two back. The pruning generally appears to be good, and without a doubt, in contradistinction to what obtained a few years ago, the judges have now no light task in awarding prizes.

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After the trials that our vineyards have latterly been through, it is to be hoped that some of our more enterprising growers will try their hand at some manure tests. During the past season Mr. D. Tolley, on my advice, divided up an even lot of vines into several plots, that were treated as follows:—

First plot—3cwts. sulphate of ammonia to acre
Second plot—2cwts. sulphate of potash to acre.
Third plot—2cwts. superphosphate to acre
Fourth plot—2cwts. sulphate of ammonia to acre; 1½cwt. sulphate of potash; 1cwt. superphosphate.
Fifth plot—4cwts. gypsum.

As might have been expected, there was no noticeable increase of fruit, but the foliage and wood was much better. In all probability during the incoming season the fruit yield will be appreciably increased.

It is generally recommended in manuring a vineyard to spread the fertilising matter broadcast, as the roots of the plants occupy all the intervening place. Whilst this practice is certainly correct for bulky manures, such as farmyard manure, &c., I have come to doubt its efficacy in the case of more concentrated manures, such as superphosphates, sulphate of ammonia, &c. In consequence, during the present season, instead of spreading these manures as I have hitherto done, I am having them sown in two furrows running down the middle of the rows. Later on we shall be able to see to what extent this method is satisfactory.

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To those who have been urging that because of the presence of the phylloxera in our neighbors' vineyards we should start planting American-grafted stock, may be quoted the example of Tunis. The latter country is as yet free from the pest, but its immediate neighbor, Algeria, is badly infested. And yet, as recent statistics show, we find a rapid extension of vineyards without American stock. In 1893 the area under vines amounted to 14,940 acres, whilst in 1899 we find the figure risen to 19,017 acres.

NOTES ON VEGETABLE-GROWING FOR JULY.

By George Quinn, Horticultural Instructor.

To the vegetable gardener on the plains this is a period of great activity, during which the final crops of most kinds of winter vegetables will be sown or planted.

Peas, carrots, parsnips, turnips, red and silver beets, spinach, and parsley will be sown in drills, and cabbages, cauliflowers, broccoli, lettuces, onions, and celery transplanted from the seed beds.

Potatoes may be planted, but the grower should avoid using tubers that have been raised in the same locality, and especially on similar soils. The tubers should be set deeply in the ground, to secure more moisture later on, and the delayed appearance of the shoots above the soil may prove an advantage where late frosts occasionally occur. Good plump "setts" which are sprouting should be used, and those with a small number of vigorous-looking "eyes" preferred. It is affirmed that the setts start better if pressed firmly into the soil at planting. After setting them a good sprinkling of bonedust can be spread along the furrow, to the advantage of the plants later on.

The usual successional plots of radishes, cresses, &c., for salad purposes should be sown.

Growing celery should be banked up with earth from time to time to ensure proper blanching of the leaf stalks

The surface of the soil should be constantly hoed or forked between growing crops to check the growth of weeds and aerate the soil. Dressings of manures should be sprinkled in during these operations. With the exception of peas and beans, sulphate of ammonia or nitrate of soda are beneficial, while superphosphate seems to benefit most kinds. If not already done the old seed stems must be removed from asparagus beds and the surface enriched by the forking in of a good coat of well-rotted farmyard manure. Kainit is highly recommended as a manure to be applied to asparagus beds in winter. From 10lbs. to 20lbs. per 40 sq. yds is recommended by English growers. New beds of asparagus and spring rhubarb should be prepared by trenching the ground about 2ft. deep. Keep the subsoil on the bottom and mix with it coarse bonedust or stable manure. Some of our successful growers use 1cwt. of the former to the rod of ground. If stable manure is used a wheelbarrowful can be worked into about every yard square of the subsoil without fear of over doing it.

A start should be made with tomatoes by sowing the seeds in pots and boxes placed in frames, or in the soil spread over the manure inside the warm pit.

A simple hot pit is made by placing a box sloping to the north upon a couple of loads of fresh stable manure, and piling more of the manure around the sides. This manure inside and outside the frame or box should be stamped down firmly. A calico or glass roof should be placed over the top after sowing. When the plants appear the roof must be removed during mild days and all possible light admitted to prevent the young plants becoming drawn and weakened.

All watering should be done in the morning, and if the soil becomes over-wetted the young plants will damp off—that is, rot away at the ground line. They should be thinned out occasionally if a close even germination has been obtained.

All growing crops of carrots, turnips, parsnips, lettuces, beets, radishes, &c., should be carefully thinned in the initial stages. Neglect of this work is usually a fruitful source of failure in the amateurs' vegetable crops.

Slugs and snails are usually very troublesome at this time of the year. The best common remedy is fresh lime. To reduce these pests to a minimum constant dustings are necessary. If the grower perforates with a wire nail half a kerosine tin, cut lengthways, and nails a small block on each end at the top outer edges, a good cheap distributor will result. For every night during a fortnight a dusting should be applied. The lime will not hurt the plants, and will improve the soil physically in most gardens. Traps of cabbage leaves laid on the ground harbor the slugs, from beneath which they must be collected each morning. All thick shrubs or low edgings form favorite sheltering places for these pests, and the absence of any such will render their subjection much easier.

ORCHARD NOTES FOR JULY.

By George Quinn, Horticultural Instructor.

In most fruit-growing districts the winter bids fair to prove favorable for orchard trees. Those plantations which have received a good deep early ploughing stand the best chance of profiting by the storage of moisture in the subsoil. The supply which falls immediately upon the surface should, in all but the wettest districts, be augmented by every possible means. In many situations small creeks that run after heavy showers may, by a little thought and labor, be diverted into the orchard, or roadside drains can be turned to advantage in a similar manner. For all kinds of deciduous trees this method of winter irrigation proves highly successful, save where the soil becomes sodden—a condition which ought to be remedied if successful fruit culture is to be made possible. Where a fair rainfall occurs and such helping agencies as named above may be utilised it comes within the power of the orchardist to store, by means of intelligent tillage, a good supply of moisture in the subsoil at a much lesser cost than any other form of irrigation can supply.

The planting of deciduous trees will still be in hand, but the unfortunate planter who visits the nurseries at this late period of the season will find them considerably depleted of good vigorous stock, and may have to rest satisfied with inferior trees. Small trees must not be considered inferior, but those with old dull bark and thick stunted growths are rarely satisfactory. Rather than take such the intending orchardist had better delay the planting for a season, and place his order or procure his trees early next year.

In early localities, such as some of our northern districts along the Flinders Range, the end of July will probably prove a good time for planting out citrus trees. I would strongly urge those procuring plants from a distance to get small-stock trees whose roots may be almost entirely secured in a good ball of the earth as it originally supported them—not deftly packed around the roots after they have been shaken bare by careless lifting.

The pruning of deciduous fruit trees of all kinds will still be in progress. Unless large numbers have to be operated upon, there are advantages in late pruning. With the peach the dropping of bloom buds can be noted, and allowance made for this defect. With the apricot the pale grey lines upon the future growth-producing buds clearly indicate their positions upon spur growths.

It will, I think, be conceded that the lessened opportunity afforded for the entrance of germs of decay into the sections made by pruning late is a recommendation not unworthy of consideration.

Wherever it is desirable to graft useless kinds of trees with scions from some other variety the prunings from which the scions will be made should be secured now. Well-ripened short-jointed shoots of last season's growth prove most satisfactory for this purpose, and they should be collected from healthy productive trees only and labelled, each kind being tied in a separate bundle to avoid mistakes. They should then be buried shallowly in moist soil or sand, but excessive wetness must be avoided. This causes them to remain dormant, but they retain full vitality until the sap begins to circulate in the trees to be grafted.

Trees that have been budded late in the summer should be cut back within a short distance of the yet dormant buds which were inserted.

Pitts of apricot, peach, or Myrobolan plum for raising stocks may be yet put in, but the season is somewhat advanced.

Roots and scions of blight-proof apple trees, such as Northern Spy and Winter Majetin, should be grafted at the bench ready for planting out. They are set with the grafted section well below the surface, and usually only one bud of the scion should protrude above the ground.

Seeds of passion fruits should be sown in boxes now, in a warm situation, and a pane of glass can be used as an overhead shelter with advantage to the young seedlings.

The harvesting of citrus fruits is well in progress, but it is open to question whether the majority of our oranges are not picked before they develop their best flavors. An orange is by no means fully ripe when its skin assumes a bright orange color. There is essentially a great difference between the signs of maturity displayed by the orange and the lemon. The former, if harvested while yet highly acid in flavor, will not assume its best qualities afterwards. The lemon, on the other hand, should be gathered just as it begins to show a faint tint of yellow, and then with proper manipulation and storage its available acidity increases, while at the same time its appearance is perfected.

Lemons intended for storing should be clipped—not pulled—from the trees; and in all the operations connected with it the greatest care observed. The blow that would not crack an eggshell will ruin the keeping qualities of a freshly-picked crisp-skinned lemon. After gathering they should be allowed to wilt in a verandah or shed for a few days. This toughens the outer skin by the evaporation of moisture therefrom. After this is accomplished careful selection is necessary, and all slightly pricked or damaged specimens removed from the more perfect fruits. These latter are then kept in shallow cases or trays in a cool underground room. Oranges may be kept in a similar manner, but unless they are packed in bran or some other medium their skins are liable to dry up and become parchment-like.

Whenever black aphides appear on peach trees a war of extermination should begin without delay. To observe them in time the under sides of last year's growths should be examined closely. The best remedies in the form of sprays are tobacco and soap wash, kerosene emulsion, and resin compound. The recipes of these may be obtained in pamphlet form at the office of the Agricultural Bureau.

When pruning stone fruit trees a sharp lookout should be kept for the appearance—chiefly in the forks—of the reddish sawdust of wood-boring caterpillars. If noted in time these pests may be detected beneath the sawdust masses before they have entered the hard wood layers.

Trees affected by red spiders may be fairly cleared of these mites by sprayings with kerosene emulsion or lime, salt, and sulphur compound while they are yet bare of foliage.

The best results in the suppression of fungus diseases by means of Bordeaux mixture are obtained by sprayings after the buds swell, not when they are in their present dormant condition.

WEATHER AND CROP REPORTS.

Amyton.—During early part of month the crops were in a bad state, but towards the middle steady rains fell which have brightened the prospects for a fair season. Fallowing is general and stock in fair condition.

Arden Vale.—During the middle of month good rains fell. The prospects for the season are not so good as last month. Feed is scarce and more rain wanted.

Arthurton. The commencement of the month was dry and very frosty. Crops and feed were at a standstill, but since the nice rains on the 14th and 15th they have improved. Nice showers have fallen since. Stock in fair condition.

Balaklava.—This month has been anything but a wet one, not more than 1in. of rain having fallen to the 22nd, but rain is now falling. Several sharp frosts have kept back growth of feed and wheat. On the 9th we had the sharpest frost seen here for fourteen years. The wheat in patches turned quite yellow, but crops generally now look healthy although not so forward as in other seasons. Manured crops are making more headway during the cold weather than unmanured. Lambing is progressing satisfactorily, and stock beginning to improve in condition. Farmers are fairly satisfied with the present state of things.

Baroota Whim.—Early-sown wheat is coming into ear too early. Fallowing in full swing. Stock healthy. More rain wanted.

Belair.—We have had several very severe frosts during the month. Feed has made splendid growth owing to the early rains; consequently the frosts did not do much damage. Rainfall for month (to 21st) slightly over 3in.

Booleroo South.—In the early part of the month we had very heavy frosts; but a change has come and we have had very seasonable weather—light but continuous rains. The young plants already showing the benefit of the rain. Some of the early crops are looking very well and promise a good return.

Bowhill.—Seeding almost finished. Early wheat and grass looking well. Stock in good condition.

Brinkworth.—Stock in very poor condition. Crops looking well having had splendid rain during latter part of month. Rainfall to 25th, 1·14in.

Crystal Brook.—The latter part of May was very cold with heavy frosts, but since the weather has been all that could be desired, frequent showers falling. The heaviest rain for years fell on 22nd, nearly ½in. being registered in fifteen minutes. Stock rapidly improving and crops are looking well. Rainfall, May 17 to June 23, 2·16in.

Dawson.—Owing to the continued drought and scarcity of feed many farmers have been disheartened in regard to their crops and stock, but since the 13th several showers have fallen, totalling 1·10in., which has restarted wheat and grass, and the prospects of a fair crop are not altogether banished.

Eudunda.—The month of June has been almost all that could be wished for here. The rainfall totals between 3in. and 4in. Wheat is doing splendidly, as well as feed. Stock in good condition and farmers jubilant.

Finniss.—Have had about 2½in. rain, and in consequence crops and grass are doing well.

Forster.—The weather has been dry and frosty; a good rain fell on June 13, amounting to about ½in., and making a wonderful difference in the crops and feed. Early-sown wheat is doing well, and there is plenty of feed. Late crops have not come up, as it has been too dry. Stock are in good condition.

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Gawler River.—The weather is most favorable for crops, which are looking very promising. The late frosts have cut some crops of potatoes and checked the feed, but since the rain the feed has recovered and is plentiful. Fallowing has commenced; garden work, in pruning and cultivation, is being pushed on.

Gladstone.—Have had three weeks' fine weather, and three or four severe frosts. On the 13th we had good rains, and since have had nearly 1in. The weather is still threatening and very cold; crops are coming on very fast, and some of our farmers have had to turn the sheep in to keep them down. Feed is plentiful, and altogether the outlook for the coming season is very promising.

Golden Grove.—The season so far is the best experienced for many years. Seeding is finished, and the young crops are looking well. Feed is well forward and stock in fair condition.

Johnburgh.—Splendid rains have fallen. We had half an inch during the middle of the month, and on 22nd and 23rd 1·62in. fell. This has been a most beneficial rain, and will do an immense amount of good. Already a marked improvement is noticeable in the wheat, and the feed is coming on nicely. Dams and tanks are full. Stock generally in fair condition. Everyone delighted with the improved prospects.

Kapunda.—Crops are looking well, especially those drilled in early with manure. The frosts cut things up, and potatoes were a failure, but most other crops have improved since the late rains.

Koolunga.—Crops and feed growing splendidly. Stock improving. Splendid rains this month, about 2in having fallen.

Lucindale.—This has been a very wet month, the rain being accompanied by very severe storms. Growing crops are looking very well. A large quantity of bonedust has been used this year. Lambs are coming on well, and unless the foxes, which are just now very numerous, interfere with them, a good percentage should result. Stock on the whole are looking exceedingly well.

Maitland.—Most of the month has been very dry, with very cold frosty nights. In some parts the wheat seems to be coming up very thinly and it is thought that much of it has malted owing to dry weather, but nice rain has fallen during past week. The early crops are looking very well.

Mallala.—After a long spell of dry weather and frosts, which was much against the growth of vegetation, we have had a delightful change. Good rains commenced to fall on the 13th, and have continued at intervals since. Already there is a marked improvement in the crops and grass. The land is in good order for ploughing, and the farmers are pushing on as fast as possible. Stock looking fairly well.

Millicent.—Young crops coming on well, good color and healthy; very little frost, and not very cold. Rain nearly every day this month and with some hail. All classes of stock in good demand at high prices. Good season for stock. Rainfall to date, 3¼in.

Minlaton.—Seeding is practically finished, and the early-sown crops are already beginning to stool out, having germinated much better than last year. The wheat sown recently has had the benefit of splendid soaking rains and cannot fail to come up quickly. Feed is growing well, especially on land previously manured. Horses are in better condition than for many years past. Land badly affected last year by the underground grub are now clean, and no complaints are heard in regard to this pest Up to the present the season has been very promising, all the rains that have fallen having been of a good soaking nature; so much so that many of the dams are still practically dry. Up to June 24 we have recorded 8·11in. of rain, all of which except ·27in., has fallen since March 1. Last year the rainfall to June 30 was 6·97in., of which 1·34in. fell during the first three months.

Morgan.—Month has not be very favorable. Small rains have fallen, but not sufficient to soak the land well.

Mount Bryan East.—Since last report we have had splendid rain, the best for the season; The land has been thoroughly soaked, and the grass and wheat are coming on well, but it is very cold. Rain commenced the 22nd instant, and continued at intervals until the 27th The rain reached beyond Goyder's line of rainfall, filling all the dams.

Mount Remarkable. Weather during month up to 13th has been cold and exceedingly frosty, but since then splendid rains have fallen. Vegetation growing rapidly; crops healthy and promising. Rainfall for month, 1·13 points.

Mundoora.—Nice rains fell on 13th and 18th, which will go a good way to repair the three weeks' dry weather and frost of May; although the crops and grass in many places seemed quite dead, yet they are recovering again. Fats are still very scarce, and likely to be so for some time. Fallowing has commenced in many places, and will be pretty general in this district in a week or so. Nice rains fell again during the last week of the month.

Murray Bridge.—Since last report this district has experienced dry weather and severe frosts. About the 14th a good soaking rain set in, and it has been showery since. The fields are looking green and early crops covering the ground. Feed is now recovering from the frosts. Stock fair.

Nantawarra.—Crops looking fairly well, although there has been a dry spell and severe frosts have occurred during the month. Wheat is malting on clay lands. Fallowing is being pushed on in most farms. Stock in fair condition; lambing is nearly over.

Onetree Hill.—After a spell of dry frosty weather good soaking rains have fallen. Crops are looking well, and have made good growth. Stock generally in good condition. The lambing season is almost over, and the percentage is a good one.

Orroroo.—The early part of month was very dry, with severe frosts, and cold cloudy days checked all vegetation. A change came on the 13th, and we have had good steady soaking rain ever since. Dams and tanks have been well replenished. About 2½in. of rain were registered up to the 27th. This will greatly improve the early-sown crops, and it is certain all the late-sown will start. Several farmers have again started fallowing. Stock, on the whole, are improving.

Penola.—During early part of month the weather was fine, with a few severe frosts; but towards the latter part very heavy and continuous rains fell, accompanied by heavy winds. Seeding operations are about complete.

Pine Forest.—The weather up to the 13th was very dry, but since that date a general rain fell, which revived the crops. Fallowing has commenced on many farms, and a larger area will be fallowed this year than in any other year previous. Feed is not very plentiful, but with seasonable rains stock should do well.

Port Elliot.—First two weeks of June were dry and frosty, third week showery, and on the 23rd heavy rains fell. Grass and crops looking well.

Port Pirie.—The weather up to the 13th was very dry, with sharp frosts, which damaged the gardens, and particularly the potato crops. Since then about an inch of rain has been recorded, with fine growing weather. Wheat crops and feed coming on well. Some of the early crops are too forward. Lambing is above the average of other seasons, and all stock improving fast.

Saddleworth.—Nice rains during the latter part of month, Every promise of a good season. Seeding all finished in good order. Early fallowing is general. Stock in good condition and healthy. Some complain of cows failing to get in calf this year, and ascribe it in some way to the season. Rainfall this year to June 25, 9·28in.

Tatiara.—The weather is very wet. Continuous heavy showers have fallen for several days, and the low-lying ground is under water. The early-sown crops are looking well. This seedtime has been one of the best ever known in the district, and those who have sown in good time will most likely reap the best harvest.

Wandearah.—Wheat crops have been looking well since June 14, when rain came just in time to save them from dying off. On the sandy loam the prospects of a good growth are favorable, but large areas of alluvial loam and clayey soils will be failures, the seed either not coming up or withering after a start. Grass and herbage suffered severely in May and June from insufficient rain, drying winds, and frost, but have since revived, and good growth is now being made. Lambing in March and April was not good, being about 50 per cent. May and June lambing promises to be very good, as there is now plenty of grass. Rainfall for year to date, 9·07in.

Watervale.—Have had severe frosts, which cut the feed very badly, but rain coming later has revived the grass, which now looks well. General soaking rains are required to start the springs.

Wilmington.—The recent rains have changed the whole aspect of the surrounding country. The early rains of a few months since promised a good harvest, but the dry weather coming on later checked the growth of the crops. About 24th of month a good soaking rain set in again and continued for a few days.

Yankalilla.—Fine rains fell during the month which made feed plentiful, and the prospects of a good yield very promising. Live stock are in good condition.

FARM AND DAIRY PRODUCE REPORT.

Messrs. A. W. Sandford & Company report:— July 1, 1900.

Whilst favorable weather conditions have prevailed during the past month throughout most of the settled portions of this colony, the agricultural districts in our north-east continued to languish for lack of moisture. Feed had cut off, and the young wheat plant, that had shown up several inches under the influence of the good start to the season, quite disappeared. This was exceedingly discouraging to farmers after the season had opened with such unusually good promise. During the past ten days, however, general rains have fallen, all directions participating, and hopes are now entertained that, even where vegetation had suffered most, recovery will take place—the wonderful vitality of the wheat plant, even after being apparently dead, having so often shown its recuperative properties. Cattle continue to sell at big prices; sheep are cheaper, but still realising satisfactory figures; pigs are easier. With dams and tanks now well filled, the outlook for stock-raisers is much improved.

Business in the city is very fair for the time of the year, and the recent advance in the price of wheat will, if it continues, soon create activity in country trade. Copper-mining is being steadily prosecuted, and attention continues to be bestowed on the search for gold in the neighborhood of the recent discoveries towards our Western Australian boundary.

At last there is evidence of some life in breadstuffs, reports of serious unexpected shortages in American crops having the immediate effect of galvanising the lifeless wheat markets of the world into activity. Within a few days an advance of something like 4s. a quarter was shown on London quotations, though a slight reaction has since set in, and it is difficult to forecast the future direction of values, but at any rate more acute sensitiveness may be expected to prevail. During the excitement occasioned by the rise considerable business was done throughout these colonies, the latest parcel sale reported from Melbourne (10,000 bags) having fetched 3s. 1d. Adelaide did not respond in full to the advance owing to the very great difficulty at present in fixing up freight arrangements here. Millers' offal eased back early in the month, but a demand locally and for export setting in strong a recovery took place, and now rates are on a par with values ruling a month ago. Feeding grains have been dull; quotations unchanged. Hay and chaff easier, mainly through lack of shipping facilities, Western Australian orders being passed on to Melbourne.

Until a few days ago potatoes continued to be very dragging, but, in sympathy with a firm market intercolonially, buyers are now more inclined to operate, so probably we may soon see better prices ruling. The improvement was caused when it became known that New Zealand crops were a partial failure, and that this would drive Sydney buyers more on to Tasmanian and Victorian markets. Our local supplies are coming forward mostly from the South-East, but there has also been a disposition to quit on the part of holders in other directions. The severe frosts during May and the early part of June have pretty well destroyed the early spring crop, so that local scarcity in these must occur when the time comes round. A few importations for seed are being made. Supplies of onions in this colony are ample, and holders are becoming increasingly anxious to clear their stocks, as samples generally are not keeping as well as usual.

The change to moister conditions, referred to in last, soon showed its effect upon milk production, so that dairy lines came quickly into fuller supply, and, as expected, this colony is again able to fill its butter requirements, with the prospect of having in a few weeks an increasing surplus for export. Meanwhile prices are lowering, but maintaining very well in face of the larger output. Eggs are experiencing their seasonable fall, though before spring rates are touched some fluctuations may occur; the month's trade has been very satisfactory, good export and local demand readily taking all offering. Cheeses are scarce, and notwithstanding heavy trade doing for time of year prices have not held, although no further immediate reduction on present quotations need be reckoned on. Bacon and hams have also been scarce, but a drop in value of pork has reduced quotations; the outlook, however, is assuring. Honey is dull; beeswax, brisk; almonds selling readily.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 11d. to 3s. per bushel of 60lbs.

Flour.—City brands, £6 15s. to £7; country, £6 10s. to £6 15s. per ton of 2,000lbs.

Bran.—9½d. to 10d.; pollard, 10½d to 11d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 4d. to 2s. 6d.; prime Gambier milling, 3s.; ordinary stout feeding, 2s. 7d. to 2s. 10d. per bushel of 40lbs.

Barley.—Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 5s. to £3 10s., dumped, f.o.b. Port Adelaide, per ton of 2,240lbs..

Potatoes.—Prime locals, to £3 15s.; Gambiers, £2 15s. to £2 18s.; Tasmanian, prime redskins, £4 to £4 4s. per 2,240lbs.

Onions.—Locals, £3 to £3 10s.; Mount Gambier, £2 15s. to £3 per 2,240lbs.

Butter.—Creamery and factory prints, 1s. to 1s. 1½d.; dairy and collectors', 11d. to 1s. per pound.

Cheese.—S.A. factory, choice, 7d. to 8d.; ordinary matured to good new 6d. to 7d. per pound.

Bacon.—Factory-cured sides, 7½d. to 8d.; nice farm lots, 6½d. to 7½d. per pound.

Hams.—S.A. factory, 7d. to 8d. per pound.

Eggs.—Loose, 1s.; in casks, f.o.b., 1s. 2d. per dozen.

Lard.—In bladders, 5d.; tins, 4½d. per pound.

Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 4d. to 4½d.; kernels, 9½d. per pound.

Gum.—Best clear wattle, 1¾d. per pound.

Dressed poultry.—Turkeys, 6½d. to 7d.; fowls, 5d. to 6d. per pound.

Carcass meat.—Prime shop porkers, suitable weights, from 4¾d. to 5¼d.; good baconers and medium porkers, 3¾d. to 4½d.; heavy and coarse, from 3d. downward; ordinary to prime vealers, 1½d. to 2½d. per pound.

Live poultry.—Prime table roosters, 1s. 6d. to 1s. 10d. each; medium cockerels to fair hens, 1s. 2d. to 1s. 5d; light birds, 10d. to 1s. 1d.; ducks, 2s. to 2s. 6d. for heavy weights; geese, 3s. 6d.; pigeons, 6d; turkeys, 4d. to 4½d. for fattening sorts; good table, 5d. up to 6¾d. per pound live weight for choice birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1900: —

Adelaide	3·61
Hawker	2·89
Cradock	2·30
Wilson	2·55
Quorn	2·64
Port Germein	2·03
Port Pirie	1·76
Crystal Brook	2·39
Port Broughton	2·02
Bute	1·73
Hammond	1·92
Bruce	1·58
Wilmington	2·54
Melrose	2·70
Booleroo Centre	2·12
Wirrabara	2·77
Appila	2·44
Laura	3·16
Caltowie	2·34
Jamestown	2·62
Gladstone	2·57
Georgetown	3·04
Narridy	2·23
Redhill	2·68
Koolunga	2·92
Carrieton	2·46
Eurelia	2·15
Black Rock	2·09
Orroroo	2·10
Johnburgh	1·96
Petersburg	1·65
Yongala	2·08
Terowie	1·96
Yarcowie	2·10
Hallett	3·17
Mount Bryan	2·58
Burra	2·43
Snowtown	2·20
Brinkworth	2·78
Blyth	1·73
Clare	3·29
Mintaro Central	2·16
Watervale	3·71
Auburn	2·50
Manoora	2·24
Hoyleton	2·11
Balaklava	1·93
Port Wakefield	1·15
Saddleworth	2·40
Marrabel	3·59
Riverton	4·08
Tarlee	1·18
Stockport	3·23
Hamley Bridge	2·69
Kapunda	4·30
Freeling	2·67
Stockwell	3·85
Nuriootpa	3·94
Angaston	3·01
Tanunda	5·28
Lyndoch	5·03
Mallala	3·66
Roseworthy	2·69
Gawler	3·39
Smithfield	2·85
Two Wells	3·00
Virginia	2·75
Salisbury	2·88
Teatree Gully	4·32
Magill	3·92
Mitcham	4·38
Crafers	8·69
Clarendon	9·11
Morphett Vale	5·30
Noarlunga	3·58
Willunga	3·72
Aldinga	3·40
Normanville	3·31
Yankalilla	3·70
Eudunda	4·19
Truro	3·48
Mount Pleasant	4·43
Blumberg	5·27
Gumeracha	5·95
Lobethal	6·16
Woodside	6·47
Hahndorf	6·85
Nairne	5·29
Mount Barker	6·19
Echunga	6·64
Macclesfield	4·50
Meadows	5·96
Strathalbyn	2·56
Callington	2·05
Langhorne's Bridge	1·52
Milang	1·67
Wallaroo	1·45
Kadina	1·84
Moonta	2·05
Green's Plains	1·63
Maitland	3·71
Ardrossan	3·14
Port Victoria	2·72
Curramulka	3·04
Minlaton	4·05
Stansbury	2·59
Warooka	3·34
Yorketown	3·28
Edithburgh	2·97
Fowler's Bay	2·94
Streaky Bay	3·62
Port Elliston	4·92
Port Lincoln	4·10
Cowell	1·02
Queenscliffe	2·36
Port Elliot	3·05
Goolwa	2·33
Meningie	3·16
Kingston	5·66
Robe	3·95
Beachport	4·57
Bordertown	3·48
Wolseley	2·74
Frances	3·84
Naracoorte	4·39
Lucindale	4·66
Penola	4·26
Millicent	4·49
Mount Gambier	2·98
Wellington	1·86
Murray Bridge	1·54
Mannum	1·80
Morgan	0·94
Overland Corner	1·11
Renmark	1·06

Harnessmakers' Jet.—Procure and mix 1drm. indigo, 4ozs. glue, ½oz. soft soap, ¼oz. isinglass, 2ozs. rasped logwood, 1qt. strong vinegar. Boil very slowly till reduced to a pint. Apply as thinly as possible with a piece of clean sponge to boots, harness, &c., after a thorough cleaning. Cost, 1s. per pint. Sold under many names at high prices.

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, JUNE 20, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Messrs. S. Goode, W. C. Grasby, M. Holtze, Thos. Hardy, H. Kelly, Professor Lowrie, and A. Molineux (Secretary).

Conference re Standard Bushel.

The SECRETARY reported that the gentlemen nominated by the Bureau had agreed to take part in the conference proposed to be held to consider the present system of fixing a standard bushel each season. He had received no intimation of names of representatives from the Corn Trade Sectional Committee.

Takeall.

The CHAIRMAN referred to the offer of Professor Frank to examine samples of "takeall," and also the potato moth, if forwarded to him, with a view to finding a remedy for same. He thought the Bureau should obtain specimens, as it was of great importance that we should know all about them.

Some discussion ensued, and it was suggested that Professor Lowrie should supply samples of "takeall"; but the Professor stated he was unable to do this as his crops were free from this trouble. If he found his crops affected he would not look for a fungus or insect, but would know his cultural operations were at fault. He had no hesitation in putting takeall down to bad cultivation, generally through ploughing the land dry. Early fallowing instead of late fallow was the remedy. It was decided that the Bureau would receive samples of takeall to forward to Professor Frank.

Attendance at Central Bureau Meetings.

The SECRETARY reported that during the past year the attendance at the Central Bureau meetings had been as follows:—Messrs. Krichauff, 10; Robson, 8; Sandford, 8; Grasby, 7; Goode, 6; Price, 5; Davenport, 5; Snow, 4; Valentine, 4; Hardy, 4; Kelly, 4; Holtze, 3; Miller, 2; Lowrie, 2; Homburg, 2; and Perkins, 0. Messrs. Hardy, Kelly, and Davenport had been on leave for portion of the time, and the official members were unable, owing to other important duties, to attend regularly. The average attendance was only 7·4, and he thought something should be done to secure a better attendance in the future.

Some discussion ensued, and it was pointed out that the attendance was no better than it was several years ago, when there were three less members on the roll. It was decided to meet on the third Monday in each month in the future, as being more convenient to the majority of members.

Fertilisers Act.

The Hon. Minister of Agriculture forwarded suggestions from Inspector of Fertilisers in regard to amendments required to the Fertilisers Acts to make them more effective, and asked for opinion of the Central Bureau on the subject.

In reply to questions the Inspector of Fertilisers stated that some amendments were absolutely necessary, and suggested the appointment of a committee to deal with the matter. Sir S. Davenport moved that Messrs. Krichauff, Grasby, Miller, Lowrie, and Sandford be appointed a committee, with power to report direct to the Hon. Minister. Carried.

Grand Centennial Grape.

The SECRETARY tabled samples of raisins from the Grand Centennial grape, grown and dried by Mr. A. Pomroy, of the Lyrup Village Association.

The raisins, which were of large size and attractive appearance, were greatly admired by members, but Mr. HARDY stated that the variety was not profitable to grow owing to its being such a poor bearer.

Seeds Distributed by Agricultural Bureau.

The CHAIRMAN referred to question of results obtained from seeds and plants introduced by the Bureau. There had been many useful plants introduced at various times, but they seemed to lose sight of them altogether.

The SECRETARY said very few reports were received from the members who had obtained seeds or plants from the Bureau. In quite a large number of cases where reports had been made the growers had not taken the trouble to keep the names of the varieties tested, so the reports were actually valueless. Many members seemed to have an altogether wrong idea of what was expected from them when they took seeds or plants for trial.

It was decided that the various Branches be asked to report what varieties of plants introduced by the Bureau had done well in their respective districts, and also what were in general cultivation.

Educational Vineyard and Typical Orchard.

In reply to questions, Mr. HOLTZE reported that he still had plants of all the varieties of vines planted in the Educational Vineyard, but he had never been able to ascertain whether they were correctly named, as the fruit was destroyed by thieves before half grown. The vineyard was in a very unsuitable position and unfenced. He suggested that the Old Exhibition Grounds would be more suitable.

Mr. GRASBY considered that the Educational Vineyard should be at the station of the Viticulturist, and not at the Botanic Garden. Other members agreed, and pointed out that when established the Botanic Garden was the only place available. It was useless attempting to establish the vineyard anywhere near the city, as without constant police protection it would share the same fate as the garden at the North Terrace Asylum and private gardens round Adelaide, where nothing in the way of fruit was safe from thieves. Barb-wire fences had been cut through and hedges broken down in broad daylight by the larrikins.

Mr. HOLTZE stated that he could supply a few plants of each variety of vines he had to any grower who wanted to establish a collection. In regard to the Typical Orchard at Mylor he was pleased to say that the plants set out were doing well. He had recently received a letter from a nurseryman which showed the necessity for the Typical Orchard. Some years ago he purchased from another nurseryman forty trees of a desirable variety of apple, and now found them untrue to name. He had, unfortunately, sold a good many trees grafted with this variety, and he knew the man from whom he purchased had done the same in all good faith, so that doubtless quite a number of people would find, as to this particular variety, that they had got the wrong trees. With the aid of the trees grown at the Typical Orchard it would be possible for nurserymen to make sure of their varieties. He had some plants of five varieties of hops, imported some years ago by the Bureau, and would supply a few plants to any hopgrower desiring them.

Winter Irrigation.

Mr. HARDY reported having in company with the Horticultural Instructor selected two blocks of land at Marion, on which the proposed experiments *re* winter irrigation could be carried out if the authority of the Minister was obtained. Estimates were being obtained of cost of pipes, &c., and would be submitted to the Minister. The owners of the land would provide labor for cultivation and distribution of water free. He was strongly of opinion that the experiments proposed to be undertaken would be of immense value, and would to a large extent show whether water from the mains could be profitably utilised on the Adelaide plains for the production of fruit for commercial purposes.

Noxious Weed.

Sir Samuel Davenport called attention to spread of a plant called Gomphocarpus fruticosus. It was a useless weed, contained poisonous properties, and was spreading very rapidly around the country adjoining Waterfall Gully. He had spent over £10 this year in cutting it up on some of his land where eighteen months ago there was none growing. It completely ruined good grass land, and he thought the Bureau should recommend its being placed on the list of noxious weeds.

Several members stated that this weed had been growing in the neighborhood of Adelaide for many years, and was of a very noxious character. It was decided to recommend the Hon. Minister of Agriculture to have the weed brought under the Noxious Weeds Act.

Several members pointed out that declaring a weed to be noxious was of little use, as generally no steps were taken to destroy them. Round Adelaide in particular the various weeds were allowed in most instances to spread unchecked, and in many country districts it was the same. Some alteration in the method of administering the Act was necessary.

Branch at Booleroo Centre.

The formation of a Branch at Booleroo Centre with the following gentlemen as members was approved:—Messrs W. Michael, W. H. Nottle, S. F. Parsons, J. Arthur, J. Borgas, Dr. Stevens, J. Clack, A. Milne, and C. A. Degenhardt.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Golden Grove, Mr. Randle Coles; Finniss, Messrs. Fred. Dreyer and Jos. Mills; Clarendon, Mr. J. J. Juers; Maitland, Messrs. W. Bowey and W. Adams; Port Elliot, Mr. C. Gosden; Kapunda, Mr. C. P. E. Weckert; Albert, Mr. E. E. Hoffman; Cherry Gardens, Mr. Thomas Paltridge; Bowhill, Mr. G. A. Prosser; Nantawarra, Mr. H. J. Spencer; Orroroo, Messrs. George Harding and W. Robertson.

Reports by Branches.

The Secretary reported receipt since previous meeting of fifty-eight reports of Branch meetings.

Hares Gnawing Fruit Trees.—The following ingredients have proved effective in preventing hares and rabbits gnawing the bark of fruit trees:—Procure a sufficient quantity of blood (blood from the abattoirs) to paint the boles of the trees it is intended to protect. After this has been set away in a tub or other receptacle until it begins to emit an odor add lime that has been thoroughly slaked and in sufficient quantities, stirring it briskly all the time to make the mixture of the consistency of whitewash. A little sulphur may be added with good effect. When applying the mixture to the trees take an old whitewash brush and cover all parts which the hares and rabbits can reach. One painting will last a season, and it is much easier to put on than covering the trunks in any other way, besides being more effectual.

REPORTS BY BRANCHES.

Port Elliot, June 2.

Present—Messrs. J. McLeod (Chairman), W. E. Hargreaves, H. Pannell, F. T. Fischer, J. Davidson, R. E. Ulrich, and E. Hill (Hon. Sec.).

WEEDS.—Hon. Secretary to approach the railway authorities with a view to secure extermination of Lactuca saligna on the railway lines, which, it is feared, will become troublesome by spreading on to adjacent land. [This weed is a useful fodder plant, but would be highly objectionable in an orchard or garden.—GEN. SEC.]

Tanunda, May 31.

Present—Messrs. J. H. Walden (Chairman), A. Ohlmeyer, C. Heinemann, W. Graetz, J. Gurr, J. Basedow, G. Mann, P. Trimmer, and E. Trimmer (Hon Sec.).

VINE-PRUNING.—It was decided to offer prizes of £6, £4, £2, and £1 in a vine-pruning competition, to be holden on June 27 next.

OFFICERS.—Mr. C. Heinemann was appointed Hon. Secretary in place of Mr. E. Trimmer, resigned.

Mount Pleasant, June 8.

Present—Messrs. G. Phillis (Chairman), J. F. Miller, W. M. Vigar, J. Maxwell, and H. T. Hull (Hon. Sec.).

CHANGE OF SEED AND VARIETIES.—The Hon. Secretary reported that the General Secretary advised him that he believed the cereals forwarded for identification were Ward's Prolific wheat and Beardless barley. He had strongly recommended the Skinless barley for early green feed. Mr. Miller stated that although an absolutely beardless barley was grown in the neighborhood, the sample he showed was not beardless, though the beard fell off readily. He doubted the wheat was Ward's Prolific, as for five years he grew it without there being any signs of brown heads. The longer it was grown the more brown heads there were in the crop. The heads were much shorter than Ward's Prolific (which variety he had never grown on the farm), and had a closed gummy appearance. He believed it to be caused by some disease or deterioration from White Tuscan, through growing so long on the same soil without change of seed, as portion of the crop was always of the type of White Tuscan, and of fair quality. Members expressed their strong approval of frequent changing of seed, and they intend to arrange shortly for further shipment of seed from Tasmania or elsewhere.

OFFICERS.—Mr. Phillis was re-elected Chairman. Mr. Hull tendered his resignation as he was leaving the colony. Members regretted to lose Mr. Hull, who has been Hon. Secretary of the Branch for several years.

Quorn, June 7.

Present—Messrs. R. Thompson (Chairman), Jas. Cook, J. B. Rowe, C. Patten, F. Herde, and A. F. Noll (Hon. Sec.).

FEEDING DOWN GROWING CROPS.—Mr. Herde initiated a discussion on the question as to whether it was advisable to turn the horses and cattle on the growing crop. He was not in favor of feeding down wheat in this way, but this season, owing to the dry spell, the wheat in some cases was running up too much, while in the cooler ground it was stooling well. If stock were put on to feed it down should they be removed from the crop at night? Members agreed that it was advisable to feed down the wheat if it runs to head at this season of the year, but they preferred to put on sheep rather than great stock, as they did not cut up the ground so much. Some members thought stock should not be allowed in the crop while the dew and frost is on the wheat, while others thought no harm would result from leaving them in through the night. Mr. Rowe asked if any member had noticed whether the young wheat affected the milk of cows. He put his cows on the crop, and the butter became so rank as to be unsaleable. On taking them off into grass again the butter made from their milk was all right.

Membership.—The names of several members who had shown their lack of interest in the work of the Branch by failing to attend meetings were struck off the roll.

Dowlingville, June 8.

Present—Messrs. J. Philps (Chairman), W. T. Holland, R. A. Montgomery, R. Foggo, G. Inkster, J. L. Broadbent (Hon. Sec.), and three visitors.

Paring Ploughs.—A discussion took place on shares for paring ploughs. [With what result? Surely there were some points worth noting in a discussion on this matter.—Gen. Sec.]

Water Conservation.—It was recommended to clear the soil in the catchment by rolling and scraping on wet days. Making numerous tracks to dam was suggested. To make runs, a forked log, with irons bolted on each side, and dragged over the ground, was a good instrument to cut the grass and level off.

Bulk Shipment of Wheat.—This was generally thought to be impracticable in this colony. Smaller bags, it was thought, would be much better to handle, but the sewing up would be a nuisance. Wheat bags of same length, but narrower than at present, would be more beneficial.

Harrowing Growing Crops.—It was considered that in damp weather this operation would generally benefit the wheat crops. It had been proved beneficial in many cases during the past and was very seldom detrimental.

Stockport, June 9.

Present—Messrs. G. Burdon (Chairman), D. G. Stribling, J. F. Godfree, S. Smith, F. Watts, G. Thomas, T. Howard, T. Megaw, J. Smith, T. Hogan, J. Smith, jun., and J. Murray (Hon. Sec.).

Annual Report.—The Hon. Secretary's annual report showed that during the year the average attendance was only eight members per meeting. It was decided that rule *re* non-attendance be strictly enforced in the future. Messrs. J. F. Godfree and G. Thomas were elected Chairman and Vice-chairman respectively, and Mr. J. Murray re-elected Hon. Secretary for ensuing year, a vote of thanks being accorded to the retiring officers.

Forest Trees.—The Hon. Secretary to apply to Forest Department for gum trees for members.

Field Trial of Ploughs.—In connection with the Branch a field trial of three-furrow, set, and jump ploughs was held at Stockport on Wednesday. There were about 150 people present, and Messrs. J. McLachlan, M.P., of Owen, E. F. O'Sullivan, of Tarlee, and J. G. Kelly, of Giles Corner, gave general satisfaction in judging which was by points. This being an inaugural meeting, there were not many manufacturers represented. The trial consisted in each plough ploughing about a quarter of an acre, going 3in. deep going up, and 5in. coming down, and to show a finish. Mr. G. Smith, of Stockport, showed by far the best finish in both set and jump ploughs. It was intended to test draught with dynamometer, but the machine on ground did not work satisfactorily, so the draught was not tested. The points were given for ploughing, construction, and price. The following are the total number of points obtained:—Set plough, three-furrow—J. Murray, Stockport, 180 points; J. Work, Wasleys, 161 points; J. G. Traeger, Hamley Bridge. 152 points. Jump plough, three-furrow—J. Murray, Stockport, 192 points; J. G. Traeger, Hamley Bridge, 147 points. Mr. Murray's ploughs, in both set and jump implements, being declared the winners, the proceedings closed with votes of thanks to the judges, who responded, and thought that if trials were held next year prizes should be given as well as certificates.

Wilson, June 9.

Present—Messrs. D. McNeil (Chairman), W. H. Neal, R. Rowe, H. Ward, J. H. Gill, A. Canning (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—Discussion took place on this subject. Some members thought to have a standard of 64lbs. or 65lbs. per bushel would result in loss to the farmer who may have a really good sample going 63lbs. for which he would have to accept a lower price. It was decided that while it might be advantageous to the farmer to have a different method of buying and selling wheat in the opinion of this Branch 63lbs. was quite high enough standard for first-class wheat.

Mannum, June 8.

Present—Messrs. J. G. Preiss (Chairman), W. Kowald, R. P. Scott, R. Heidrich, J. W. Walker, G. Lenger, C. Pfeiffer, E. Schuetze, A. Faehrmann, H. Brown (Hon. Sec.), and three visitors.

PEACH APHIS.—Mr. Schuetze had noticed peach aphis on one of his trees already.

SEEDING.—Mr. Faehrmann read a paper on "Some Notes on Seeding," as follows:—

The work of seeding is to all farmers a most important one, and to do it carefully and well should be the aim and object of everyone. I will endeavor to explain the lines on which I work: First—There is the selection of seed, which should be done at harvest time, and it should be taken from a field of good healthy growth, that is be free of weeds as well as of any disease to which wheat plants are subject. I would reject wheat as seed that comes from a field badly affected with takeall, which, though it is a sickness in the land rather than the wheat, still we know there is a percentage of grain pinched; the mother plant of such grain has suffered and has barely escaped total destruction. It is a point worth discussing whether such grain sown in a paddock also affected with takeall would not more readily succumb to the attack than wheat that had been grown on a sound field. But far more objectionable is seed wheat affected with ear cockle or bunt. Of the former disease I only know what I have read, having to my knowledge never seen it. For "smutty" (bunted) wheat bluestone is used for pickling, and is the most effective remedy; but the safest thing by far is to select your seed free from smut, and then pickle it, because wheat may be to all appearance free of smut and still have a few balls that get broken and infect a large quantity of seed. To avoid all danger the safest way is to pickle the seed. I have found this to answer well, as I have never been troubled with it. Then, as to the sorts to sow, Purple Straw is my favorite, but it is desirable that everyone should also have an early wheat to sow at the latter end of the season to enable the farmer to harvest a part of his crop before the other is fit for the machine, an advantage that should not be lost. Secondly comes the sowing of the seed. A few years ago hand or machine broadcasting was the only mode followed everywhere in the colonies, but in the last few years the drill has come to the front very much, and it is a step in the right direction. Up to a year ago I was of the opinion that when no fertiliser was to be used it was just as well to broadcast it, because one gets over the ground quicker, but even in this I have altered my mind, and believe now that it always pays to drill the seed because we get a more perfect distribution of seed at an even depth, and there is considerable saving of seed. In our district, with farms none too large, we have to do the best with the land we have, first, by fallowing where it can be done, and as our lands are none too rich from the beginning it has now become a necessity to use fertilisers, and the drill is the only means to do this thoroughly and economically. The only drawback is the heavy outlay at the beginning and the yearly recurring outlay for manures. Also it must not be lost sight of that by using phosphatic manures for some time land will be impoverished in potassic and nitrogenous constituents which have been removed in the crops, and it will be necessary in the future to supply them. With the low price of wheat staring us in the face this outlook is none too bright for farmers. By the most thorough cultivation, by sowing less in acreage, and thereby resting the other land, we may hope, with the judicious application of manures, to increase the yield whilst labor and expense may be saved in not having to go with machinery over large fields hardly worth harvesting. The saving in this direction applied in purchasing manures to put the land in good heart to yield profitable crops will, I hope, more than make up for the increased expenditure of the new style.

Considerable discussion ensued. Members generally favored Purple Straw as the best all-round wheat, and Steinwedel or King's Early for an early variety. Mr. Walker, as a miller, objected to Steinwedel, owing to its bad keeping qualities. Members considered it advisable to obtain seed from clean, healthy land, and free from all disease; to use the drill, even if no manure is applied; and to supply other than phosphatic fertilisers when the increased crops cause a deficiency of potash and nitrogen to manifest itself. The suggestion that the continued use of phosphates would injure the grass was considered contrary to fact.

Onetree Hill, June 15.

Present—Messrs. E. A. Kelly (Chairman), H. H. Blackham, F. Bowman, G. Bowman, W. Kelly, A. Thomas, and J. Clucas (Hon. Sec.).

EXHIBIT.—Mr. G. Bowman tabled a sheaf of green feed (King's Early wheat) which had proved very luxuriant. The crop was already 4ft. high, and some had been "laid" through the recent rain. The soil was flat and sandy. On part of it farmyard manure had been applied and on the other commercial fertiliser. The result in favor of farmyard was most striking.

MANAGEMENT OF DAIRY CATTLE.—Mr. G. Bowman read a paper to the following effect:—

Having been all my days up to the present engaged in dairying I think I can claim to have gained a varied experience.

A herd of good dairy cows cannot be built up quickly; it is a long and painstaking effort. Cows, like most things, will improve under good management, but where the management is bad they will quickly deteriorate; hence the people who are careful in the selection of their animals (due attention being paid to strain, health, and disposition, the providing of an abundance of feed and water, regular milking time, rapid and clean milking, kind and gentle treatment) will soon make progress in establishing a good and reliable dairy herd. A good dairy farmer will be an enthusiast; he will take a delight in his work, a pride in having a nice class of cattle, and his ability to market produce of the highest order. A good deal of the apparent dislike to cows, and the industry altogether looked upon as a drudgery by a great many, arises from the fact that they are not at one with their work. Lacking interest they have allowed themselves to get behind in the industry in all its branches.

In order to have a good class of cows there must be good management all along the line. The calves should receive the very best attention, for they are to be the future cows. By using a pure-bred bull of a dairy type, his ancestors having proved their worth as milk yielders or butter producers, a large percentage of the heifer calves can be safely kept, and will turn out well. Calves when dropped should be placed in a sheltered place, and receive as much as they will drink of their dam's milk for a few days; then for a few weeks separated or skim milk can be given with a pint or two of whole milk added. After that period, until weaning time at 4 or 5 months old, they will do on separated milk alone. Care should be taken that the milk is warm; that is one of advantage in having a separator: the milk can be fed direct from he machine, all that is necessary being to remove the froth else there would be inflation from wind. Each calf should be fed separately. The practice followed by some who empty all the milk into one vessel and let the calves help themselves is an objectionable one for the reason that quick feeders get more than their share to the great detriment of the others Calves should be given plenty of milk, but not over-fed, but it would be better to err on this side than the other.

We have reared scores of calves on the lines laid down here without any losses from disorders of stomach, which are frequent when meals and compounds are substituted for new and whole milk. A well-reared calf will have a bright look and animated appearance, suggestive of a well-nourished body. An ill-fed calf will have a forlorn look and dejected appearance, indicating an impoverished condition. If calves are early, and have the spring before them, at the proper time they should be weaned gradually, and will then do for themselves, generally. But in this fickle climate conditions are not always favorable for the growth of the young stock. In times of scarcity feed should be provided, so that they will not become stunted, but kept in a growing condition. Late calves should have special attention, and be provided with feed of some kind until the autumn grass is sufficient. Some owners are indifferent as to the condition of their young stock. They are weaned off, no matter what time of year, and allowed to take their chance, with the result that they soon become "pot-bellied." Young stock reared like this receive a check which greatly handicaps their future usefulness.

When the heifers come into profit, at from 2 to 3 years, they should receive the best treatment. In order to get them reconciled to their new conditions it is a good plan to get them home for about three weeks before calving and give some feed. It is surprising how quickly advances made in this way will calm the easily disturbed, and the breaking-in process will be greatly simplified. Some breeds of cows are highly sensitive, and will be greatly disturbed by signs of roughness or hardness in the owners; but, on the other hand, they will quickly respond to kindness and gentleness. The late John Ruskin has written, "All creatures would yield in gentle service if we gave them gentle mastery." This is undeniably true with regard to the dairy cow. A little coaxing and stroking works wonders, and brings its reward; but the only caress cows get from some people is from the end of a pitchfork or from the toe of a boot.

The process of milking should be done regularly, as to time. Cows are punctual animals, and like to be relieved of their milk at their accustomed time. The day should be as nearly divided as possible, and in order to do this, milking should be done first thing in the morning. This is important when the animal is in full milk. Milking should be done rapidly, and yet smoothly. There are milkers and milkers. A good milker will have his mind concentrated on his work, and no milk whatever will be left with the cow. On the other hand, a slow or listless milker will not get all the milk in a good many cases, and no amount of after-stripping would get it, simply because milker and cow have not been in harmony. A good milker will get a quart or more milk from high-class cows than a careless milker; hence, in the one case cows will improve, whilst in the other they will go back. If a cow puts on flesh it is either of two things – the cow is inferior, or the milker is not up to his work. Again, the process of milking should be cleanly. Before milking, the udder should be well washed with water and dried. The advantages of this are twofold. Scientists tell us that butter is the most nutritious article of food we have; hence the importance of having it of the choicest quality. Neglect at milking time is one reason why butter is inferior. But, again, cleanliness adds to the comfort of the cow by removing dirt, &c., which often causes cracks and sores on the teats. Anyone who has accustomed himself to cleansing the udder before the operation of milking would revolt at milking in the primitive fashion. Young cows, particularly, suffer greatly from swelling and tenderness. Fresh butter is the best thing possible to apply, and should be well rubbed in with hand. For sore teats, also, it is an effectual remedy. Cows with white teats are more liable to become sore than those with brown, so that it is important to try and secure those with the darker shade. This can be accomplished by attention to the male, which should enhance his value over another, other points being equal. Again, the milking should be done with as little friction as possible between the person and the cow. Leg-roping should only be allowed in very extreme cases, such as injury to the udder. Cows that can be managed in this way are of more value, and are readily sold as family cows. On a well-regulated dairy all cross-natured and tough milking cows will be got rid of at once, no matter how excellent they are in other respects. It is cows of that character that tend to the dislike taken by many to milking. Cows should be tested as to their value as milk givers or butter producers, and only those coming up to a set standard should have a place in the herd.

No place will be properly managed unless a cow register is kept; by this it can be known exactly when the cows will come in, and they can be dried off accordingly and given the necessary spell, which should be at least eight weeks. I do not think it is well for a cow to have two calves within the twelve months as a rule, for two reasons—first, on account of the strain that would naturally be placed on the cow's constitution; secondly, there would be a loss in the quantity of butter produced if the cow were allowed to go in calf, say, three weeks after coming in on account of the calf requiring a good deal of the nourishment that would otherwise be turned into milk. If this course were adopted it would be therefore necessary to keep the bull secured, and the cow also should be kept apart from the others, for if allowed to run at that particular time she would cause unrest in the herd.

Cows newly in require special care and feeding. Easily-digested food should be given, such as bran mashes; the bran should be given hot and as a slop. This kind of food, to which dark sugar could be added, will greatly aid the animal in clearing the system at this particular time.

It must be remembered that cows bred up to a high state of excellence as milkers will have great stress put upon them, and should therefore in every way possible have the best attention. This class of cow will also, if in high condition and running on luxuriant pasture at the time of calving, be in danger of taking what is known as milk fever. There are various remedies advanced for this; but having had loss two years ago from this complaint we have adopted milking before calving with good results. Some of the cows have been milked twice a day for a week before coming in. When there is evidence that the cow is overburdened with milk it seems to me to be consistent that she should be relieved; but at the same time it is not well to have cows come in during the dead of winter (unless shelter is provided), for the animal in its anxiety for the loss of the calf will expose herself in the wildest weather, and thus may give trouble to the owner if not actual loss. One of the most important features in dairying is the feeding. For several months when the natural grasses are abundant cows will do for themselves, but as soon as the grass is drying recourse must be had to feeding if the milk supply would be kept up and the condition of the cow preserved. This is a critical time, for the summer crops which should be provided will not be ready. A good plan is to have a sheltered place sown with a late-maturing cereal, which can be cut and fed to cows with profit to the owner and benefit to the cows. It is terrible bad management to keep on milking cows throughout the summer without nourishing food, and then to be turned out with wasted frames to pick up what they can during the autumn and early winter.

One of the best of summer feeds is lucern, and wherever it will thrive should be grown. It is feared by many owing to the danger of hoven and the odor it imparts to the milk. We do not find any difficulty in this way; we have had cows running in it knee-high, but of course they are only allowed to pasture thereon for a short time; for the first few days after that they can be allowed on it for two or three hours without danger. If hungry cattle were turned on to any green feed of luxuriant growth injudiciously they would most likely become blown. Then, as to taint, we find the milk from the cows quite odorous, but if separated immediately the odor is almost completely gone. During the separating process if you go to the skim milk can the odor is pronounced, but in the cream vessel it is reduced to a minimum; it seems feasible enough that the odor should cling to the skim milk, it being the heavier body, whereas under the pan-setting system the cream remaining on the milk for the necessary time would become so tainted that when made into butter the flavor would be disagreeable. Lucern will provide feed until the crops sown with first rain for green feed are ready. This has been an exceptionally early season, and very favorable for the growth of green feed. We had King's wheat sown 1st of March, coming out in head and ready to cut early in May, and now (in June) it is standing well over the fence; so that by the growth of lucern cows will have good feed during the summer and autumn, and direct from that to the early-sown green feed, which will tide them on to the time when the grass is abundant. It is a good plan to sow several varieties of seeds for early green feed; cows like a change and do well thereby. A good-sized piece of ground could be sown, and the cows allowed to run on it when the weather is dry, and on wet days the more forward feed on other patches could be cut for them. Sown crops keep on growing when the grass is at a standstill. Cows are very fond of the feed on cultivated paddocks; it is fresher and sweeter, especially in the winter, than the grass paddocks. Young stock as well have a great relish for feed after phosphatic manuring. I have seen them remain persistently on feed of this kind when grass has been plentiful elsewhere.

Cows should be supplied with plenty of water; this is of great importance, because they will not be at their best without it. On many places the water is so far away that one drink a day is all the cows get; this is not enough. Impaction of the digestive organs is often the result of want of water. Anyone going in for dairying should try and provide water as close as possible to the yard, so that the animals can get it whenever needed. Cows will often go without water when badly needing it rather than travel a distance to quench their thirst. A great deal more could be done in this direction than is the case. I will tell of a case in point—A young man recently returned from the West and decided to go farming; the place which he secured was one apparently suitable for dairying, but the former occupants could not get on with the industry owing to losses of cows; the new-comer believed that their non-success lay in that the cows had a difficult climb to and from water, and would therefore often go without it, so he resolved to remedy that, and he now has a windmill close to the water's edge forcing water to the top of the hill, a distance of over 300ft., and having the water convenient the cows are known to drink as often as three times daily, and are doing well. Money spent in this way is certainly well laid out.

All dairying farmers alive to their own interests will see that their stock are well cared for in every particular, and thus they will be acting up to the injunction of the wisest of men, who said, " Be thou diligent to know the state of thy flocks and look well to thy herds."

Mr. Bowman, in discussion, said the windmill referred to was Paternoster's, and that it forced a good supply up a steep hill to an elevation of 340ft.

Meadows, June 4.

Present—Messrs J. Catt (Chairman), T. B. Brooks, G. Ellis, G. Usher, W. Nicolle, W. J. Stone, F. W Dohnt, D. Tester, W. Pearson, G. T. Griggs, F. W. Vickery, D. D. Murphy (Hon. Sec.), and one visitor.

PAPER.—Mr. Catt read a short paper on " Volcanic Action on Arable Land."

NEW POTATOES —Mr. Usher tabled samples of potatoes grown from setts received from the Bureau ; he had lost the names of the varieties, but the results had been satisfactory. [When seeds or setts of new varieties of plants are distributed by the Bureau, it is naturally expected that the recipient will take care to keep them under their names, as otherwise their reports are absolutely valueless. Surely this is not too much to expect of our members.—GEN. SEC.]

HEDGES.—In reply to question the Hon. Secretary was advised that the most satisfactory hedge for this locality was the " monthly rose." It grew well here and did not spread, either by suckering or seeds. It should be planted during the winter.

PICKLING SEED WHEAT.—Mr. Stone asked if any member had tried lime alone as a pickle ? None of the members had tried this, it being generally agreed that pickling with bluestone was the most satisfactory preventive of bunt.

LUCERN PEST.—A discussion took place on the damage done by the lucern pest (Smynthurus). Mr. Pearson had seen it recommended to spray with iron sulphate.

WEEDS.—Discussion took place on various weeds and methods of treatment.

OFFICERS.—Mr. W. Pearson was elected Chairman and Mr. Murphy re-elected Hon. Secretary for ensuing year.

Mount Compass, June 9.

Present—Messrs. M. Jacobs (Chairman), F. Slater, R. Cameron, S. Arthur, J. Jenkins, R. Peters, W. Gowling, C. S Hancock, A. J. Hancock (Hon. Sec.), and two visitors.

CALENDAR OF MONTH.—Prepare ground for onion planting, later on sow early carrots and parsnips.

TOBACCO.—Mr. Slater tabled sample of locally-grown and manufactured tobacco, which was considered a very creditable sample though, of course, not up to the standard imported article.

POTATOES.—Mr. Slater initiated a discussion on " Does it injure potatoes if the fibrous roots are broken when hoeing or hilling up." Members considered it best to lightly cultivate when the potatoes are just breaking through the ground, and that it was most injurious to hoe too near the plants when they have attained any size. Members also favor planting at about 7in. in the ground ; this applies to the peaty soils of this locality.

OFFICERS.—Messrs. M. Jacobs and A. J. Hancock were re-elected Chairman and Hon. Secretary respectively, and Mr. R. Cameron elected Vice-chairman for ensuing year.

Wandearah, June 15.

Present—Messrs. G. Robertson (Chairman), E. H. Eagle, W. Munday, G. Collins, J. Wall, W. Halliday, W. Roberts, J. Kurl, W. J. Fuller, R. J. Dennis, A. W. Davidson, C. E. Birks (Hon. Sec.), and one visitor.

FALLOWING.—The Chairman initiated a discussion on this subject. The majority of members favored early fallowing, commencing as soon after seeding as possible. Fallowing operations should only be carried on while the land is in good condition for working. Some members considered the scarifier preferable to the plough for fallowing work in this district. while others favored the skim plough. With either implement the land could be brought to a finer tilth than with the ordinary plough, but the work must be done before the weeds grow too strong. Mr. Eagle said he used the scarifier when fallowing, the first time only very shallow, the next crossways and a little deeper, and so on, as he considered the land required it. In sandy land, liable to drift, the plough was preferred, as it left the land rougher. Working the land after harvest was not, as a rule, considered good practice.

SHEEP.—Mr. Dennis read an interesting paper on this subject, which was well discussed.

ANNUAL REPORT.—During the past year the average attendance of members was 9·27. The Chairman and Hon. Secretary were thanked for past services and re-elected for ensuing year.

Richman's Creek, June 11.

Present—Messrs. W. Freebairn (Chairman), J. M. Kelly, A. Knauerhase, J. A. Knox, J. McSkimming, P. J. O'Donohue, F. Mattner, A. Nicholson, J. J. Gebert, J. McColl (Hon. Sec.), and two visitors.

HINTS ON WHEAT-GROWING.—Mr. J. J. Gebert read a paper on this subject to the following effect:—

> From my experience of the country I feel sure wheat could be grown with success and profit in the North if the system of cropping only fallow land was generally adopted. If the portion of the farm used for cultivation purposes were divided into two parts, one could be cropped and the other fallowed early in the winter each year, when the soil is usually in much better condition for working, and will retain the moisture much longer when under crop than if the land is worked dry. Besides this, there is the opportunity of killing weeds and keeping the land clean. If this system were adopted, I feel certain that the result would be better crops, better samples of wheat, for which better prices would be obtained in the European markets. Then again expenses would be lessened—it would require fewer ploughshares and less strength to work the land during winter; and, besides, the dry seasons would not injure the crops so much. Farmers could also choose their time for seeding to a certain extent. Cropping the land for several years in succession was a great mistake, as the land worked so often when dry gets very weedy, and does not hold moisture well. The results of the past seasons show that well-worked fallow land gave up to 20bush. per acre, while crops put in in the ordinary way gave in many cases only 3bush. or 4bush.

The Chairman pointed out that the cropping only of fallowed land saved a lot of labor at seed time, but, taking the whole preparation of the soil, there was quite as much labor. Nearly all of his crop this season was on fallow land. Mr. McSkimming agreed that fallow gave the best returns, but thought that it would take more land than most of them had to work it as suggested. Mr. O'Donohue said it would require a good deal of strength to fallow sufficient land for the season's crop. Mr. Mattner's crop on early fallow was not looking so well as that on land fallowed later, being very weedy. Mr. Knauerhase had been told by some of the southern farmers that they had more success since cropping the land once in three years than when cropping twice in succession. His own experience was that early fallow gave the best crops, but few farmers had sufficient land to crop only fallow. The Hon. Secretary's experience was that well-worked fallow on the average gave about one-third more per acre than stubble land.

Bakara, June 7.

Present—Messrs. R. Barrow (Chairman), H. R. Hayward, R. Wilson, A. Lehmann, A. Hermann, F. Hermann, J. E. A. Seidel, and F. C. H. Martens (Hon. Sec.).

RULES OF BRANCH.—Suggested rules for conduct of business, as forwarded by Central Bureau, were adopted.

RABBIT DESTRUCTION —Discussion took place on this subject. Mr. Hayward favored poisoning with strychnine and pollard, Mr. Wilson pollard and phosphorus, and the Hon. Secretary phosphorised wheat. Members reported crops in many cases had been seriously damaged, and some would have to be re-sown. It was considered impossible to save the crop from damage without wire-netting the farms.

Boothby, June 12.

Present—Messrs. J. T. White (Chairman), T. Sims, D. Sims, H. G. Evans, J. R. Way. G. T. Way, A. Rob, R. Chaplin, R. Carn (Hon. Sec.). and one visitor.

CONFERENCE.—Members of Elbow Hill and Boothby Branches will meet a Mr. E. Wake's residence on July 10.

POTATO ONIONS.—Mr. T. Sims wishes to know whether potato onions are profitable to grow in dry districts? [For own family use it may be worth while to grow them, but for marketing it will probably be better to grow the ordinary marketing varieties.—GEN. SEC.]

CLIMBING CUCUMBERS.—Mr. Evans said the climbing Japanese cucumber was a splendid variety, requiring very little water; but the seeds did not fill out properly.

Port Lincoln, May 18.

Present—Messrs. W. Laidlaw (Chairman), R. Puckridge, J. P. Barrand, W. E. Goode, J. O'Shanahan, E Chapman, Geo. Dorward, J. E C. Richardson, R. Sullivan, Dr. Kinmont, and J. Anderson (Hon. Sec.).

AGRICULTURAL CHEMISTRY.—Dr. Kinmont gave the first of a series of lectures on "Agricultural Chemistry in its relation to Fertilisers." He dealt principally with the chemical constituents of the soil and plants, and by interesting experiments showed how the various gases are evolved.

Port Lincoln, June 18.

Present—Messrs. W. Laidlaw (Chairman), R. Puckridge, W. E. Goode, J. O'Shanahan, Dr. Kinmont, and J. Anderson (Hon. Sec.).

JUDICIOUS FARMING.—Mr. Puckridge read a paper to the following effect:—

Farmers do not all conduct their work judiciously. Many do not pay sufficient attention to the storage of sufficient fodder for their live stock, and they cannot fallow and till their land sufficiently when their cattle are only half fed. All land should be fallowed subsequently to being cropped. This land, being worked after fallow to kill weeds, can be sown early, and clean samples and heavy crops will follow. Fallowed land will take in the early rains, but if the field is left for ploughing until after the first rains much of the water will flow away on the hard surface to the nearest channel and thus be lost. Grain sown on dry fallow before the first rains is not so liable to bunt as when sown on wet soil. Analyses of soils to ascertain what is deficient is very costly, and not so satisfactory as are experiments with small plots treated with various manures and mixtures of manures. A single analysis of a field would not be sufficient, as soils differ in character at very short distances apart. The best plan is to drill in several lands side by side separately with various manures, and the resulting crops will supply the desired information. He had found Alkali super. the best to use on poor heath land that had sickened of colonial island guano. There is great advantage in change of seed about each third year. Purple Straw seems to lose its character, the straw becomes white, and it is less prolific.

Agricultural Chemistry.—Dr. Kinmont gave his second lecture upon "Agricultural Chemistry in its relation to Fertilisers," illustrated by several very instructive experiments and diagrams and charts.

Lucindale, June 9.

Present—Messrs. E. Feuerheerdt (Chairman), A. Carmichael, B. A. Feuerheerdt, W. Dow, H. Langberg, J. Bourne, George Humphries, and thirty visitors.

Potatoes.—The Chairman reported that from 7lbs. of seed potatoes received from Mr. F. Krichauff (Chairman Central Bureau) two years ago, he had now 12¾cwts., and would supply seed to any members requiring same. There were four varieties worthy of cultivation.

Wool-classing.—Mr. George Jeffrey, Instructor on Wool for School of Mines and Industries, gave an address on "Wool," to the following effect:—

Mr. Jeffrey dwelt on the class of sheep to raise for wool, and expressed the opinion that in the case of Merinos, large-framed strong wool sheep were more profitable than the small-framed finer woolled sheep, and explained his reasons for prefering them at some length. He then spoke on wool-classing, and advised that this work should be performed so that the buyer could readily estimate the true value of the wool. All wool was gauged by the quantity of clean wool and foreign substance in it, and it was therefore highly necessary that the fine conditioned and heavy conditioned wool should be classed separately. Every clip should be got up in as attractive a manner as possible. If they realised that 1 per cent. more or less in the estimate of value meant a difference of a ¼d. in the pound they would perceive the necessity of getting up their clips for market in the best possible way to give buyers every opportunity to gauge its value at a glance. Buyers looked with suspicion upon mixed wools. Length of staple should also be taken into consideration, and it would be well to keep clothing and combing wools distinct. He did not believe in making too many classes, but would advise, say, four classes, viz., fine quality, medium qauliy, coarse, and a cast sort, and clearly explained the reasons for what he advocated. At the conclusion he invited questions to be asked to elucidate anything that he had not made himself clear in. Mr. A. Carmichael exhibited a number of samples of wool carefully and neatly arranged, and by these the lecturer was enabled to make interesting explanations in connection with classing wool. Mr. Stewart asked a number of questions concerning the difference between clothing and combing sorts, and the length the former should be. The lecturer explained that manufacturers with the improvements that had been made in machinery were enabled to comb wool which is recognised as clothing sorts, but he still thought it very necessary in classing to keep the combing and clothing sorts apart. Mr. Jeffrey announced that his object in lecturing at Lucindale was to form a class. Those who intended to join the class could give their names to the chairman or secretary of the Branch Bureau. The minimum number of a class was eight, and the fee 10s. for twelve lessons. He knew there was a large number of small sheepfarmers in the district who got up their own clips for market, and he thought he could give them some knowledge which would be of great use to them. A vote of thanks was passed to Mr. Jeffrey.

Scales Bay, June 2.

Present—Messrs. J. J. Roberts (Chairman), A. Newbold, G. Newbold, W. Thomas, R. S. Thomas, E. R. Aitcheson, and D. P. Thomas (Hon. Sec).

Stacking of Wheat.—Members are of the opinion that, where wheat has to be stacked at a landing place where it cannot be protected in a shed, there should be good dunnage of mallee logs with light withes across. Then stack the bags with perpendicular walls, placing plenty of paper or rags amongst the bags for the mice to make nests with—else they will cut up the sacks for material. Finish the top with a good slope. Cover with sheet iron, roofing felt, or tarpaulin. Protect the walls with bagging. This will amply repay if heavy rains should fall. The material will last for years if care is taken of it. Where stacks are to be made at the homestead, dunnage should also be used, but a permanent shed should be erected, with a good roof, even if without walls, as it will always be convenient. Where sheds cannot be constructed, the stack should be built well, with plenty of paper, rags, or "cocky chaff" intermixed, and topped with a high gable. Long and light rails should then be put from top of roof and extending about 24in. beyond the walls. Upon these place light brush and cover with wheat straw. The Hon. Sec. said he had this year seen a stack of wheat preserved pefectly in this way, whilst unprotected stacks were ruined by the rain.

Cradock, June 9.

Present—Messrs. R. Ruddock (Chairman), J. H. Iredell, P. Gillick, R. Solly, T. Marsh, B. Garnet, P. O'Dea, W. Symons, W. Haggerty, J. H. Lindo (Hon. Sec.), and four visitors.

PICKLING WHEAT.—The Chairman called attention to error in June *Journal* in report of their May Meeting In discussing the question of pickled and unpickled seed he stated that the latter came up quicker and more regular than pickled seed, but he thought the crops from pickled seed stood dry weather best, but just the opposite statement was credited to him in the report.

ANNUAL REPORT.—The Hon. Secretary reported that during the year eleven meetings had been held, with an average attendance of 7·5 members out of thirteen on the roll, and two visitors. Thirteen definite subjects had been under consideration, and many practical hints and useful observations had been exchanged between the members.

TWO-BUSHEL WHEAT BAGS.—Mr. Iredell read extract from June *Journal re* adoption of the two-bushel bag by the Farmers' Association of New South Wales, and asked whether it would be an advantage to farmers to adopt this size bag. Members thought the small bags would rather increase the cost of cleaning and bagging, and would not be so useful for chaff, &c., when done with for wheat.

STOCK COMPLAINT.—Mr. Marsh showed portion of the stomach of a horse that had died suddenly. The whole of the paunch covering the contents was as thin almost as fine gossamer. Members thought this due to some kind of parasite, but Mr. Marsh said that none were to be found on the paunch when the *post mortem* was made.

Penola, June 9.

Present—Messrs. E. A. Stoney (Chairman), J. T. Morris, D. McKay, H. Ricketts. L. W. Peake, Dr. Ockley, J. W. H. Sandiford. J. D. Wilson, S. B. Worthington, W. Miller, E. McBain, and R. Fowler (Hon. Sec.).

EXCURSION FARES ON RAILWAYS.—Discussion took place on question of difference in special excursions fares charged on the Southern line from Adelaide and to Adelaide.

PICKLING WHEAT.—Mr. Ricketts stated that when he used ¾lb. of bluestone in 4galls. water to the bag of wheat his crop was quite clean, but when using only ½lb. to the bag the result was very different. He would like to know if any harm would result from using 1lb. of bluestone to the bag. This year he had used a solution of Little's Dipping Fluid—1 in 70—with the seed to protect it against sparrows. He would like to know if any members of the Bureau had tried any similar experiments to protect the wheat against birds, &c. Some discussion took place on bluestone pickling, and a number of questions were raised. Does constant dipping in of seed when pickling weaken the solution or otherwise? [No; the strength of the solution is absolutely unaffected.—GEN. SEC.] How much bluestone should be used to the bag of wheat? how much water should be used? how long should the seed be dipped? and what is the best method of pickling? [When pickling in a bluestone solution it is not so much a question as to how much bluestone should be used to the bag of wheat as what strength solution should be used. A weaker solution would be used with seed apparently unaffected than with seed known to be "smutty." For clean seed 8ozs. bluestone dissolved in 5galls. water is strong enough; for infected seed use up to 1lb. to 5galls. Allow the seed to remain in the pickle for five minutes. When the pickle runs low add more of same strength. Undoubtedly the most effectual way of securing the best result is to pickle in such a manner that every grain of wheat is thoroughly wetted and the unbroken bunt balls removed from the seed. See illustration in March issue, p. 683.—GEN. SEC.]

WOOL-CLASSING.—On the 11th June Mr. George Jeffrey gave an instructive lecture on "Wool-classing," and afterwards formed a class for practical instruction, with twelve members.

Redhill, June 7.

Present—Messrs. S. H. Treloar (Chairman), H. Darwin, F. C. Wake, R. H. Siviour, A. A. Robertson, F. Wheaton, D. Lithgow, W. Steele, J. Pilkington, R. T. Nicholls, and J. N. Lithgow (Hon. Sec.).

CONGRESS.—It was resolved that two delegates be sent to the forthcoming Congress; also favoring Congress meetings commencing on the Tuesday of Show week in order to avoid clashing with the meetings of the Farmers' Union and other organisations.

FENCING.—Mr. Wheaton read a short paper on this subject to the following effect:—

In dealing with this subject it was with the hope of obtaining more information from the members than he was able to give himself, and he would like to see the matter well discussed. To make the best fence for this district, one to keep in ordinary sheep and cattle, not too expensive, but durable and strong, good posts were absolutely necessary. Red gum and white mallee made the best posts, the former for preference. Posts should be 5ft. 5in. long and 6in. by 4in. thick, and set in the ground 2ft. Line strainers should be 7ft. long and 8in. across at the narrow end if round, or 8in. by 6in. if split. The corner strainers and gate posts should be a foot longer and heavier than the line strainers, and be at least 4ft. in the ground. Line strainers should be set 3ft. deep. Posts should be 36ft. apart with three iron standards between each, with every tenth post a strainer. A barb-wire should be fixed on top, and beneath it five wires, using Waite's No. 8 special. The first wire should be 6in. or 7in. from the ground, then the second and third 5in., fourth 6in., fifth 8in., and the top 11in. above, making a fence 3ft. 5in. high, with the strainers about 6in. higher. The barb wire should be tied down to the top of post and standards, a notch being taken out of the standards for the wire to lie in. The splice he favored was made as follows:—Make a bow with one end of wire, then put the other end through the bow and give it five or six turns with the wire key, taking care that the first turn is not too short. A piece of soft steel wire is required for ends of the barb wire at the strainers. His estimate of cost of a fence of this description was £42 5s. 6d. per mile, plus any gates necessary, made up as follows:—

Seventeen strainers at 2s. 6d , and 130 posts at 1s.	£8	12	6
440 standards at 5¼d.	9	12	6
Struts	0	5	0
4cwt. barb wire at 17s., and 1 ton steel wire, £15..............	18	8	0
Labor—Erecting 17 strainers at 10d., posts at 5d..............	3	8	4
Wire for fastening down 2s. 6d., erecting standards at 1d.	1	19	2
Total	£42	5	6

Some members agreed that the style of fence described was the best for this district, but there was some diversity of opinion as to gauge and height. A uniform gauge throughout the district was advocated to secure cheaper standards. Others preferred post-and-dropper fence, with Waite's special fencing wire. Members wished for information *re* dipping posts in bluestone solution to prevent injury by white ants. [This has been found by several persons to be effectual.—GEN. SEC.].

Mount Remarkable, June 7.

Present—Messrs. A. Mitchell (Chairman), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, J. B. Murrell, D. Roper, and T. H. Casley (Hon. Sec.).

CONGRESS.—It was resolved to send one or more delegates to the Twelfth Annual Congress, to be held in September.

SOILS.—Mr. Roper read some very interesting notes on soils, how formed and classified, which he proposed to continue as opportunity offered.

Mallala, May 7.

Present—Messrs. H. B. Moody (Chairman), S. Churches, G. Marshman, M. H. East, J. Jenkins, W. R. Stephenson (Hon. Sec.), and two visitors.

BULK HANDLING OF WHEAT.—The Hon. Secretary read article by Mr. Jno. Darling, M.P., on this subject, also editorial from *The Farm and Dairy*, together with article on grain elevators in Victoria. A general discussion ensued, and it was resolved that, in the opinion of this Branch, the elevator system of handling wheat was impracticable as far as South Australia is concerned.

Swan Reach, June 9.

Present—Messrs. F. Baker (Chairman), P Beck, F. Brecht, B. Swarz, D. Raw, L. Fidge, P. Hasse, W. Hecker (Hon. Sec.), and one visitor.

CONGRESS.—Decided to send two delegates to forthcoming Congress.

FERTILISERS.—The Hon. Secretary said a farmer in the neighborhood had stated that he got good results from dressing his land with the deposits obtained from the bottom of the river lagoons at low water as when using super. He thought it worth members' while trying this when opportunity offered.

Mallala, June 4.

Present—Messrs. H. B. Moody (Chairman), S. Churches, G. Marshman, S. Temby. A. F. Wilson, F. M. Warden, Jas. McCabe, J. Jenkins, A. Moody, G. W. Bischof, W. Temby, W. R. Stevenson (Hon. Sec.), and three visitors.

ANNUAL REPORT.—The Hon. Secretary's report of the year's proceedings showed that the attendance of the members had been fairly good, numerous practical matters had been well discussed, and generally the discussions had been helpful. The *Journal of Agriculture* was much appreciated by members, and the visits of Professor Lowrie and the General Secretary had been very instructive. Mr. G. Marshman, J.P., was elected Chairman, and Mr. W. R. Stephenson re-elected Hon. Secretary.

CONGRESS.—Delegates were appointed to attend forthcoming Congress in September.

"SOURSOPS."—Members wished to know whether the application of any acids would destroy the weed known as "soursops" (Oxalis cernua), or could the Central Bureau recommend any method of eradication. [No acids can be practically used to exterminate "soursops." Overstocking with sheep, or the growth of a rapid-growing, smothering crop will be effectual.—GEN. SEC.]

KAFFIR CORN.—Mr. Bischof tabled sample of Kaffir corn grown from seed received from the Bureau. It was still looking fairly healthy and was about 4ft. high.

STANDARD SAMPLE OF WHEAT.—It was agreed that, in the opinion of this Branch, the standard should be fixed at 64lbs. per bushel, and anything over paid for.

Morphett Vale, June 6.

Present—Messrs. L. F. Christie (Chairman), T. Anderson, A. Jones, J. McLeod, A. C. Pocock, J. Depledge, F. C. Pocock. and J R. Bain.

RED SPIDER AND LUCERN PEST.—Mr. Jones reported that the "red spider" (Tetranychus tellarius) were very plentiful on his potatoes, and were completely stripping the stalks. It was stated that although the lucern "flea" (Smynthurus viridis) was very bad in the surrounding districts it had not yet made its appearance here.

PICKLING WHEAT.—Discussion on this subject took place, most of the members favoring pickling. Mr. Jones sowed all his wheat dry, and did not believe in pickling.

DUTY ON FERTILISERS AND BINDERS.—Members wished to know what duty was charged on superphosphate and on string binders. [None on fertilisers, 27½ per cent. on binders.—GEN. SEC.]

Gumeracha, June 11.

Present—Messrs. D. Hanna (Chairman), A. Moore, A. E. Lee, Dr. Stephens, W. V. Bond, J. Monfries, J. C. Gall, W. A. Lee, T. W. Martin (Hon Sec.), and one visitor.

CONGRESS.—Delegates were appointed, and Mr. W. A. Lee offered a paper on "The Dairying Industry." It was decided that the Hon. Secretary inquire if some concession as to fares can be made to those delegates and members of Branches who cannot avail themselves of the free passes and reduced fares on the railway. [Those Branches situated away from lines of railway are certainly at a disadvantage in this matter. The cost to the public funds of carrying delegates on the railway free is actually nil, but if we paid coach and steamer fares where railways are not available it would mean a considerable expenditure, probably £50.—GEN. SEC.]

SHEEP-BREEDING IN SOUTH AUSTRALIA.—Mr. Gall read the following paper on this subject :—

The pastoral industry in Australia has been worked for all it is worth, and the amount of capital expended in improving, not only the richer coastal portions of the continent, but also the dry, inhospitable interior, rendering it fit for the occupation by sheep, is almost incredible. No other industry in these colonies has been studied so closely, and when the conditions of country and climate have been favorable, much money has been made But notwithstanding the most lavish expenditure of capital, labor, and energy, it is a melancholy fact that the great northern portion of South Australia, and also an immense tract of country joining the South Australian border in New South Wales, has for a good many years past proved a veritable sink for the capital of those who have ventured into it. Originally all this country, notwithstanding its scanty rainfall, was admirably adapted for sheep, and its present lamentable condition can be attributed principally to two causes. In the first place, mismanagement and overstocking ; and, secondly, the advent of the rabbit.

The effect of overstocking the country might have been rectified in time, and by judicious management the edible shrubs and plants, with which the country abounded in its virgin state, might have been protected and encouraged to re-establish themselves, but this is now rendered impossible by the rabbits, which take good care that neither salt, cotton, or blue bush shall ever get a start again. A very large portion of our northern country, instead of being covered with edible bush, is now a grass country, and as it is blessed with only from 6in. to 8in. of rain per annum the grass refuses to flourish, and consequently the carrying capability of the country has depreciated to such an extent that it is very hard to say how many or how few sheep it is possible to keep on a given piece of country from year's end to year's end, while the difficulties of management are now very much greater.

Shearing time is the sheepfarmers' harvest, and is the busiest part of the year on a sheep station, but for a month or more before the actual shearing commences, the work of classing and drafting the sheep finds full employment for the manager and the station hands. On a station shearing, say 50,000 sheep, there are generally from 6,000 to 7,000 maiden ewes. These ewes have all to be carefully handled, and the faulty sheep taken out and marked with a distinguishing mark. After shearing they should be disposed of at the best price obtainable. The rams should also be looked to, and any inferior animal marked, either for castration or sale. The ewes and lambs should not require drafting if paddock fences are fairly secure, but all the dry sheep should be straightened up, so that they may be brought to the shed, shorn, and returned to the various paddocks set apart for them. The less drafting of sheep at shearing time the better; the work should be done before shearing starts. Machine shearing in dry country has not proved a success. The quantity of sand taken up by the wool causes so many breakages, and the wear and tear of machinery is so great that it has been found cheaper to shear by hand. In fixing the date on which to start the shearing the condition of sheep and country should be taken into account, as in seasons when grass and feed is abundant it is advisable that the wool should be off before the grass commences to seed, otherwise considerable loss may occur from the seeds getting into the wool. A description of the management of the shed, and treatment of the clip would occupy more space and time than I have at my disposal, so you must consider shearing operations completed and the sheep back in their paddock. Usually by this time the country is commencing to dry up, and although in a fairly good season (and if the run is not overstocked) feed should be plentiful, all the natural surface water has disappeared, and it is necessary to watch the sheep closely and see that they are going to the various tanks and watering places regularly.

It is most important that surplus stock should be disposed of as early after shearing as possible, providing their condition and the market is favorable. Wethers should not be held after they are full mouthed, and unless breeding ewes have some special merit they should be cleared at five years old. In former years, when the country was well bushed, it was customary to lamb as early as April, but of latter years the date of lambing has been made later, and May is now looked upon as the most favorable month. For May lambing the rams are placed with the ewes in December. The last year's lambs are then drafted from their mothers and cross weaned, that is they are put with other ewes. This is done in order that the ewes with which the lambs are placed may lead them into water. In dry seasons when lambs are not cross weaned serious losses often occur. The percentage of rams used depends a great deal on the size of the paddocks and the condition of the pasture. When ewes are shepherded I have seen over 100 per cent. of lambs marked and only 1 per cent. of rams used, but with large flocks of ewes running in paddocks I think it advisable that not less than two rams for every hundred ewes should be used. The rams require careful attention for at least a fortnight after they are placed with the ewes; the paddocks should be mustered two or three times during that period, as the rams are very liable to stray away by themselves. Four or five weeks is long enough to leave the rams and ewes together, providing the sheep are in good condition, and on removing them care should be taken that all the rams come in. The long dry season is the most anxious time for the station manager, and he is frequently hard pressed to keep the sheep alive, and if, as is often the case in our northern country, he finds he has more sheep on the run than he can find feed and water for his prayers for rain are frequent and fervent, and his faith in Providence when hot winds and duststorms succeed each other day after day is sorely strained. If however rain sets in in April, and he has fortunately managed to pull his twenty odd thousand breeding ewes through the summer, he commences to smile, and continues smiling, and improves in condition almost as quickly as his own sheep. Providing there is plenty of surface water and feed, the less the ewes are disturbed during lambing the better. About the middle of June lamb-tailing commences, the ewes and lambs are mustered, and the lambs run off through the drafting race into a pen by themselves. A smart cutter will keep five or six lads catching the lambs fully employed, and should get through from twelve to fifteen hundred lambs comfortably in a day. It is not necessary to describe the operation of castration, but considering the rough and ready way in which the operation is performed, it is wonderful what a small percentage of deaths occur. Severe frost or heavy rain will often cause a loss, but if the weather is mild no dea hs worth notice occur. After marking the lambs are turned out with their mothers. Between tailing time and the classing of sheep before shearing there is no special work to be done. But a bright look out has to be kept that dingoes do not interfere with the ewes and lambs. Eaglehawks are also sometimes very destructive, but are easily destroyed with poison.

On small holdings, such as most of us occupy, a different system of management is of course necessary. In the first place I doubt if breeding will pay, and think that fattening for the Adelaide market will give a better and speedier return. With the Gumeracha climate and soil the cultivation of fodder plants will, I feel certain, in the future be found profitable. Already, I am informed, first-rate returns on a small scale have been obtained from the cultivation of rape and the grazing of the same by sheep. There are many other plants and grasses which deserve a trial. The most profitable sheep to graze in country such as this are either Merino and Lincoln or the Merino and Southdown cross. Not only must size, weight, and quality of carcass be taken into account, but the quality of wool, even in a butcher's sheep, is also of the first importance. The Merino-Lincoln crossbred is a sheep which grows to a great size and fattens easily, cutting a heavy and valuable fleece. He is a good forager, and if feed is scarce in his own paddock is not above commandeering rations from his neighbor. The same remarks apply to the Southdown cross, excepting that he is perhaps hardly such a rogue as the Lincoln. I think they are both preferable in small holdings to the pure Merino. For fattening purposes full-grown sheep only should be purchased · Sheep from four to six years old are those which will put on flesh the quickest and require less food than those which have not reached maturity. Very great care must be taken not to overstock paddocks which are set apart for fattening purposes. More losses occur from overstocking on both large and small holdings than from any other cause, or perhaps all other causes put together.

Port Pirie, June 9.

Present—Messrs. P. J. Spain (Chairman), T. Johns, W. Smith, H. B. Welch, W. K. Mallyon, T. Gambrell, J. Lawrie, G. M. Wright, and R. J. Ferry (Hon. Sec.).

Wool-sorting.—A class for study of wool sorting to be formed, and first meeting to be holden in September.

Millicent, June 13.

Present—Messrs. R. Campbell (Chairman), S. J. Stuckey, H. F. Holzgrefe, H. A. Stewart, W. J. Whennen, H. Warland, G. Mutton, H. Oberlander, F. E. Wehl, and E. J. Harris (Hon. Sec.).

Field Peas.—Members consider that spring is the best time to sow peas in this locality, as soon as possible after ploughing; but where the land is clean they do best on a stale furrow.

Johnson Grass.—Mr. Johnson was informed that Johnson grass (Sorghum halepense, or Aleppo grass) is a bad weed to have in an orchard; but is a good grass on land not wanted for cropping. The Chairman said some members had found it impossible to eradicate this grass from their orchards.

Salt for Cattle.—The Hon. Secretary read an article from a paper which argued that all great milking breeds of cattle have originated near the sea coast, where saline herbage prevails to a greater or lesser extent. Great Britain, Holland, Belgium, Denmark, Brittany, Alderney, Guernsey, Orkney, Switzerland, and other coastal countries were cited in support of the theory. To test the question at Mississippi Experiment Station, three cows were kept without any saline mixture in their food, and the milk from each was weighed twice a day for two weeks. For the next two weeks each cow received daily 4ozs. of prepared salt in her ration. For the fortnight during which the cows were without salt, the milk weighed 454lb.; for the fortnight during which they received salt their milk weighed 564lb., and it was of better quality. The finest mutton in France comes from the salt marshes of Normandy; the mutton from Shetland and Orkney sheep, feeding largely on seaweed, is delicious. There is no equal to the mutton of Merinos fed on saltbush, or on samphire and pigfaces.

VALUE OF TREE-PLANTING.—The Chairman read a clipping as follows:—"One of the happiest places in the world is said to be Orsa, in Sweden. The community has, in the course of a generation, sold nearly £1,000,000 worth of trees, and by means of judicious replanting has provided for a similar income every thirty or forty years. In consequence of this commercial wealth there are no taxes. Railways, telephones, &c., are free, and so are schoolhouses, teaching, and many other things."

NAPIER FESCUE.—The Hon. Secretary said Napier fescue (Festuca slatior) is growing well on Messrs. Williams' Brothers land, and promises to be the best grass to grow on the reclaimed Wyrie swamp lands.

EXHIBITION, LECTURES, AND SOCIAL.–On June 13 the Branch arranged with the Millicent Grange to hold a social evening and have an exhibition of products and manufactures, combined with addresses from Professor W. Lowrie, M.A., B.Sc., &c., principal of Roseworthy Agricultural College, and Mr. Geo. Quinn, Government Horticultural Instructor, &c. There was a large number of visitors present, and the tables were loaded with exhibits. Mr. H. A. Stewart staged the largest variety and Mr. H. Oberlander the second greatest variety of products. There were ten other exhibitors of products and manufactures. Interspersed with the addresses and discussions thereon were several songs, recitations, and musical selections. Professor Lowrie felt that as this is an agricultural district the subject of "Manures and Manuring" was the most important towards which their attention could be directed. That there was room for considerable improvement was his excuse for preaching to them a sermon that he had repeated and reiterated many times in the North. They would, however, have noticed that in the North it had been put forward that it was best to keep the land in phosphates and leave the nitrogenous manures alone. They would have to modify that in the South-East. That system, though it seemed unorthodox, yet worked out to the best economic advantage in that dry country. There the practice of leaving land fallowed was right enough, but here, with a plentiful rainfall, there was danger that heavy rains would leach plant foods from the soil. There were ingredients of the soil that were absolutely necessary to plant life and others not much needed. Their fathers did not know much of this, but Davey, and others following him and working in the line of pure agricultural chemistry, had demonstrated that phosphorus, nitrogen, potash, iron, lime, and magnesia were indispensable to plant life, and, that of these, nitrogen, phosphorus and potash were most easily exhausted. Our fathers merely let paddocks lie after the soil had been exhausted and allowed nature to restore them. Modern methods were too rapid for that, and they had to resort to artificial means to make good the deficiency. In the North the addition of nitrogen was not needed. He had land that had received no artificial supply of nitrogen that now carried double the crops it did in former years. The explanation was that dry, warm climates enabled the nitrogen microbes to work with the greatest activity, and the light rainfall did not tend to leach away soluble nitrates. Down here, with a colder climate and heavy rainfall, they could not go on for years with a mere phosphate dressing as they could in the North. Substances like bonedust, superphosphate, basic-slag, and bone-chalk had to be added to the soil. Where they had soils with much organic matter they could use less soluble manures, because the acids of the soil did the work to accomplish which the chemist had to make use of strong acids. Basic slag, for instance, would, he believed, do well on the peat lands. Farmers should carry on experiments for themselves, and a small plot of land set apart for this purpose would soon repay the farmer for his trouble and expenditure. The kind of crops and the rate of cropping would have to be considered in the regulation of quantities. Some farmers put on a sprinkling of 50lbs. to the acre, but these must believe that some mystical power lay in this peppering of fertilisers. He advocated 1cwt., 1½cwt., or 2cwts. to the acre. They should put in more than the plant used, for it was impossible that the plant should reach every part of the dressing applied. If they applied only the equivalent to the plant food taken out the soil got no better, but they should strive to get the land to its highest economical productive power. It is better to put on a good dressing and bring it up to a good condition at once. Here they grew a good many forage crops, and these were more exhaustive than cereals. Potatoes were two or three times more exhausting than wheat. In growing rape, kale, or mangolds, and feeding these off the land received again from eight-ninths to nine-tenths of the plant food. There was some danger in this district that they would lose nitrates from the soil, and they would sooner or later have to supply nitrogen. This was the most expensive of manures, and they could escape the cost of an artificial supply by growing leguminous crops, such as clover or peas. These crops increase the bacterial life of the soil. Here, too, he believed, the whole cycle of farming should work round to the supply of fat stock to the market. Potash was another substance that might be missing, but he had not seen a case where the use of muriates of potash returned a profit to the user. Care should be exercised in the use of it, for its property of drawing moisture from the soil made it possible that the muriate would kill the seed. As a general recommendation he advised them not to be too thrifty in the use of phosphate manures. In reply to Mr. S. J. Stuckey, the Professor said that he believed in feeding crops off the land. To Mr. R. Campbell he said that the chief reasons why a wheat crop yielded so well after an exhausting crop like potatoes were that the land was much better worked for potatoes, and farmers generally were more liberal with the fertiliser on potatoes than on wheat. To Mr. W. Lyon he said that about one bushel to the acre was a fair quantity of wheat to sow, but the quantity varied according to the cleanliness of the land. His reply provoked some discussion among farmers present, whose experience hardly agreed with the speaker. Mr. Quinn dealt rather briefly with the use of manures for the orchard. Phosphates had much effect on the early ripening of fruits, and potash favorably affected flavour and succulence. He believed the prospects for apple exports were good, and apple orchards will repay for work done. Votes of thanks to the ladies who provided the refreshments and to all others concerned closed the meeting.

STANDARD SAMPLE OF WHEAT.—The Chairman read a paper on this subject, and a short discussion followed.

Forest Range, June 14.

Present—Messrs. A. Green (Chairman), J. Sharpe, O. Kumnick, C. Stafford, and J. Caldwell (Hon. Sec.).

RINGBARKING TREES.—Members thought that if the sapwood was properly cut into in ringbarking the tree was sure to die. Mr. Stafford thought about March the best time to ring trees in this district, as there was not so much trouble with the shoots as if the trees are ringed in the spring. Mr. Kummick found the trees died more quickly if ringed during the first two quarters of the moon.

MACARONI WHEAT.—Mr. Zimmermann tabled sample of Etawah wheat, and wished to know whether it would be suitable for macaroni making, and whether it was much grown; also, samples of Premier and Ward's Prolific wheat, and asked whether the latter was considered a good miller's wheat. [Ward's Prolific wheat is generally objected to by the miller, and cannot be classed as a first-class milling wheat. Etawah wheat is grown largely, I believe, in India, but owing to small hard grain it has never been grown commercially here. I cannot say whether it would be good for macaroni or not.—GEN. SEC.]

Cherry Gardens, June 12.

Present—Messrs. R. Gibbins (Chairman), T. Jacobs, C. Lewis, J. Lewis, G. Brumby, G. Hicks, J. Potter, E. Wright, H. F. Broadbent, J. Metcalf, J. Richards, A. Broadbent, and C. Ricks (Hon. Sec.).

CONGRESS.—Delegates were appointed to attend the Annual Congress in Adelaide.

WHITE MILAN TURNIP.—Mr. Metcalf reported very favorably of this variety of turnip received from Central Bureau. It was of good quality, and fit to pull within seven weeks of sowing.

SALT AS A FERTILISER.—Mr. Potter asked how much salt to apply per acre. Mr. Jacobs said it would depend upon the soil and the crop; for wheat about 2cwts, and potatoes 5cwts. per acre. [The greatest care must be exercised in applying salt, as not only may the crop be injured, but also the land itself. —GEN. SEC.]

LEMONS.—The Hon. Secretary tabled very fine lemons grown by himself, the trees having been planted four years all but a few months.

Holder, June 9.

Present—Messrs. J. Rowe (Chairman), E. Jaeschke, H. Perry, J. Green, H. Vaughan, H. Blizard, J. J. Odgers (Hon. Sec.), and four visitors.

REPORTS AND DISCUSSIONS.—Mr. Jaeschke reported that Hungarian Brome grass was growing well and looked promising. Several articles from the *Journal of Agriculture* were read and discussed. Members were of opinion that on the question of deep and shallow ploughing the nature of the soil to be worked must govern the operations. They were also of opinion that the drying off of the first tendril on the vine was no sure sign that the melon was ripe.

Wilmington, June 11.

Present—Messrs. J. Hutchens (Chairman), J. Hannagan, M. Gray, H. Noll, J. Zimmermann, J. McLeod, J. Lauterbach, T. H. Harris, W. Slee, and R. G. S. Payne (Hon. Sec.).

Officers—Messrs. J. Hutchens and R. G. S. Payne were re-elected Chairman and Hon. Secretary for ensuing year.

SPARROW POISONING.—Mr. Gray stated that he had been very successful in poisoning sparrows. He put a quarter stick of phosphorus into half a gallon of water and, when thoroughly dissolved, added 7lbs. of wheat, which was allowed to simmer until soft, it was then let to get cold and scattered broadcast; he had no sparrows troubling him now.

FERTILISERS.—The Hon. Secretary read a paper on "Fertilisers and their Uses on our Soils," to the following effect:—

I do not propose to submit to your consideration anything like an exhaustive paper upon this very important subject to a farming community, but rather submit a few practical hints upon methods within the reach of the ordinary cultivator of the soil as a means of subsistence. It cannot be gainsaid that many thus employed become slaves to labor without realising anything like a commensurate return for their laborious toil. This need not be, indeed it should not be. I am not an agriculturist in the strict sense of the word, that is, I do not earn my bread by this occupation, but I do claim to be a cultivator of the soil, and that for the best of reasons. I find a pleasure in it, and I derive profit therefrom.

It behoves everyone who would succeed in any vocation of life to look around, and gain experience by what is going on, in other words, we must be observant. Science is doing much to-day of an advanced order, but it is different to scientific pursuits of the past decade, in that its discoveries are reduced to simple language, and the practical deductions can be understood and applied by all. To those who say "My forefathers did so and so and they succeeded, and what they did, and how they did it, is good enough for me," I have nothing to say, but to those who are combating the vicissitudes of production and labor, and would pick up grains of useful information where they can, to such it is a pleasure to submit simple truths, hoping that they may be the gainers thereby.

Nature is a wonderful storehouse and provider, and doubtless what she does is done perfectly, but it may happen, and without doubt does so happen, that the demand upon her provisions is greater than the available supply. It stands as a simple rule of everyday life that if there is an unceasing demand upon a certain supply without an adequate return the supply will soon become exhausted, and someone must suffer. Now I take it to be so with our lands. There is a vast supply of both chemical constituents, organic and inorganic matter, in our soils, but if we go on making an incessant demand upon the one without restoration we shall soon find the result of production anything but satisfactory. Just as our bodies require suitable and nourishing food to develop the various organisms, so our plants, of whatever kind, require plant food, equally stimulating and nutritious, or there will result a weakly growth, just as a poorly fed child will develop into pitiable manhood And just as a hungry growing child must not be compelled to go and search out its food, no more must a plant, to be healthy and vigorous, be required to extend its roots unnaturally in search of nourishment. Constant cropping will soon exhaust the active plant food unless there be a system of restoration. Nature will do this if the necessary time be allowed, but since in most cases the same land has to be again and again employed it must be clear that artifice must intervene. I will submit in this short paper three methods of restoring the vigor to our lands.

I. Rest and nature's process.
II. Alternating crops.
III. Active and soluble manures.

The first, to men of small areas, is not practicable. The second also has its drawbacks, as climate and demand may not be favorable, hence we must revert to the third as the most sensible and economical method of accomplishing the desired result. A sensible man will ask—"What fertiliser shall I adopt to give me the best return?" This is a big question. Good results have been obtained from ordinary stable manure when it has been properly prepared, and for garden purposes I prefer it to chemical manures for many reasons. By stable manure I do not mean the refuse that has been scattered about during long periods and exposed to all weathers before being applied to the land, thus losing much of its soluble constituents by excess of moisture, oxidation, and absorption. But such manure, to do its work of restoration to the land, must retain its natural phospates, sulphates, and nitrates. If this be so, by properly storing in a shallow, water-tight pit, then you have a cheap and effective manure. But for cereals I would not recommend this as the better manure for all climates. In good, wet soils no doubt it is an advantage, as in its decomposition it supplies warmth to the young plant, and leaves an amount of healthy humus. But in parts where the rainfall is limited I cannot say that its use is a wise act, as it would quickly absorb a large amount of moisture, and, if more rain did not come, would cause the plant to wither. Then one more objection to stable manure—unless properly treated it produces too many weeds. Preference must, therefore, for wheat-growing generally be given to chemical manures, applied with the drill. Of such manures there are plenty to select from; but for cheapness and combined efficiency superphosphate stands first, in which you have a supply of soluble fertiliser, which will give body to the plant and increased activity to its growth.

Port Germein, June 9.

Present—Messrs. G. Stone (Chairman), W. Head, C. O'Loughlin, E. McHugh, D. Thomson, J. R. Gluyas, W. Mortess, H. Kingcome, A. Thomson, J. K. Deer, W. Broadbear, W. Crittenden, and A. H. Thomas (Hon. Sec.).

Stock.—Inspector Needham has visited this district, and declares it to be the healthiest he has yet visited.

Bag Question.—The Chairman suggested that the purchaser should return an equal number of sacks, of similar quality to those received from the farmer. After a long discussion, no better plan than that at present followed could be decided upon.

Standard Bushel.—Members agree with Professor Lowrie in this matter, and consider that the system adopted by buyers in testing weight of wheat is not satisfactory.

Woodside, June 11.

Present—Messrs. R. Caldwell, M.P. (Chairman), J. C. Pfeiffer, F. W. Drogemuller, A. Pfeiffer, F. Heidrich, N. Schroder, J. D. Johnston, C. W. Fowler, W. Rabach, R. W. Kleinschmidt, R. P. Keddie, and G. F. Lauterbach (Hon. Sec.).

THE THOROUGHBRED HORSE.—The Chairman read a paper on this subject prepared by Mr. E. Esau, and chiefly descriptive of the points of racehorses.

THE FERTILISERS ACT.—The Chairman read the following paper:—

The Need of Further Protection to the Producer in the Purchase of Artificial Manures.

The question was one of more than ordinary importance to the producer at the present time, for, as cultivation or cropping from year to year was impairing the fertility of the land, the need of something to replace the essentials of plant life was becoming more and more apparent. The ordinary sources of supply were being heavily drawn upon in the interests of the wheat-fields of Europe The nitrate beds of South America, from which millions of tons of fertilising substance have been obtained, according to report, will soon be worked out. Consequently the supply of other substances will be heavily taxed, and unless care is taken inferior matters will be put upon the market. Already very inferior stuff had found its way to this colony, which had resulted in loss and dissatisfaction to those who had used it. It is true that all manure offered for sale is supposed to be subject to inspection under the provisions of the Fertilisers Act, but these provisions were not altogether satisfactory. At any rate, people were entitled to receive value for their money, and to secure this some alteration will require to be made in the Act, and even then a most rigid inspection will have to be insisted on. Experience has shown that it was desirable to have the brands of all firms manufacturing artificial manure registered, and when registering any particular fertiliser the manufacturer should be bound to furnish the department with a certified guarantee of the different ingredients. I believe this is invariably done in America and in other countries. The payment of a small registration fee should be demanded.

Provision ought to be made in the Act for a standard. It is well known that genuine bone-dust contains as much as 55 per cent. phosphate; greasy and dirty bones yield about 46 per cent. The standard for this manure should be fixed at, say, 40 per cent. phosphate. Anything of a lower grade should be sold under a different name, if not in a different class.

In bone or guano super there should be not less than 12 per cent. water soluble phosphate. I have been informed that some of the bonedust sampled during the present year contained as low a percentage as 30 per cent. of phosphate, hence, as compared with the genuine article, it was adulterated to the extent of 25 per cent.—a very serious deficiency, so far as the producer is concerned. It is also reported on good authority that so-called super has been put upon the local market containing less than 1 per cent. water soluble phosphate. The Act should also be altered so as to obviate the necessity, in the case of fraud, of proving the sale of an adulterated fertiliser. Experience has shown in nine cases out of ten that this is extremely difficult. It should be sufficient for the inspector to prove that the sample taken by him was a fair average one of the stuff made to be put upon the market, and of which a registered guarantee had been given. The fullest publicity should be given to the guaranteed analyses, the inspectors' analyses, the value per ton, and any other information that will tend to secure the protection of those who buy and use the manure. At present the public is largely in the hands of manufacturers. Of course most of them are doing their best to produce and sell a fertiliser that will be creditable to them and those who use it, but others are not so scrupulous, and in the interests of all a better protection should be secured.

It was resolved that, in the opinion of this Branch, the Fertilisers Act should be so amended as to provide better protection to users of commercial fertilisers.

STANDARD WEIGHT OF CHAFF.—Mr. Kleinschmidt referred to this question. He regretted that, although the matter had been brought before the Government by the Central Bureau, no steps had been taken to make the legal standard weight for the bag of chaff 42lbs. He felt very strongly on this matter, and maintained that four-fifths of the members of the Bureau who had considered the question were in favor of a standard legal weight for chaff. He wished that the Central Bureau would be again asked to take the matter up, and press it upon the notice of the Government, and that the members for the district be asked to support.

CODLIN MOTH.—Mr. Keddie initiated a discussion on this subject. Instead of declaring individual gardens infested, the whole colony should be so declared, and owners of clean gardens given a certificate by the inspector to that effect.

He thought this would prove more effective than the present method of dealing with the pest. He took exception to decision of the inspector in several cases. He also mentioned that one instance he knew of a good eating-apple and a cooking variety were grafted on the same stock. The former fruits were badly infested while the latter were quite free. It was well known that the caterpillars were conveyed from the Adelaide market in empty cases to orchards, the owners of which claimed that their trees were free.

HON. SECRETARY.—Mr G. F. Lauterbach tendered his resignation as Hon. Secretary, owing to press of other work. Mr. A. S. Hughes was elected to the vacant office.

Orroroo, June 15.

Present—Messrs. W. S. Lillecrapp (Chairman), S. Roberts, R. Coulter, M. Opperman, J. Scriven, J. Moody, T. H. P. Tapscott (Hon. Sec.), and one visitor.

PICKLING WHEAT.—This subject was again discussed, and though some difference of opinion existed, the majority of the members were of opinion that pickling with bluestone was an almost certain preventive of bunt.

Arden Vale, June 10.

Present—Messrs. A. Hannemann (Chairman), C. Pearce, P. Starr, L. Warren, A. W. Fricker, G. H. Willis, E. H. Warren (Hon. Sec.), and several visitors.

BUNT.—The Hon. Secretary called attention to following letter in *Australasian*, from Mr. W. Farrer, of New South Wales, in regard to his experiments with bunt in wheat:—

> The notice by "Talpa" in your issue of May 19 of my paper, describing some experiments made during the past season with bunt on wheat, does not state the results I obtained which are of immediate use to farmers. I shall, therefore, give them briefly, in order that such of your wheatgrowers as have not finished their sowing will be able to make a trial of formalin this season. The problem of finding out whether a solution of formalin can be made which is strong enough on the one hand to make sure of killing spores of bunt, and weak enough on the other to leave the vitality of the seed uninjured, has, unless some of the results obtained were erroneous, been solved by my latest experiments. Seeds of wheat were soaked for three minutes in solutions of formalin of several strengths, ranging from 2ozs. of that substance in 35lbs. to 60lbs. of water. The first of these solutions was found not to injure the germinating power, for of 250 seeds which had been treated with it, when they were tested for vitality, all germinated readily, and only slightly slower than untreated seeds, while none of the spores on seeds which had been infected and afterwards treated with the weakest of these solutions were found by Mr. McAlpine to be alive. On the strength of the last of these experiments I recommended in my paper the use of a solution of the strength of 2ozs. in 35lbs. of water, and an immersion in it of four minutes This treatment, of course, will not kill the spores contained in unbroken bunt balls, which are liable, especially while they are still soft after immersion, to break and infect the grain afresh. And even if they remain unbroken, they are still liable, but of course to a less degree, when they are sown with the grain to infect in the soil adjacent wheat plants, especially if the soil be moist at the time of sowing. The problem to which I am specially addressing myself this season is that of devising a simple and inexpensive apparatus, and, if possible, one that can be made on a farm, for ridding a bulk of grain of contained bunt balls before it is treated with a solution of formalin. The unfavorable results from treatment with bluestone came as a surprise to myself.

Members wished to know what "formalin" is, and hence obtained [The unfavorable results in this single instance from the use of bluestone cannot be accepted as satisfactory evidence that bluestone is not efficacious as a preventive of bunt when we have the experience of so many experimenters and practical farmers to the contrary. "Formalin" is a trade preparation of formaldehyde, and is a very powerful germicide, which requires to be used with discretion, or the germinating power of the seed would be injured.—GEN. SEC.]

ADELAIDE INDUSTRIAL EXHIBITION.—Mr. Fricker, in reporting on the exhibition, said he noticed many innovations in agricultural machinery which, in his opinion, were not all improvements. In nearly every instance the work for show purposes was very good, particularly the painting; but he deplored the fact that much of the machinery for sale was not well painted, and in a very short time the timber shows signs of wear. He referred specially to the collections of pumping gear, oil engines, &c., which were very instructive.

Gladstone, June 2.

Present—Messrs. C. Gallasch (Chairman), W. A. Wornum, J. Shephard, J. H. Sargent, J. Rundle, J. Gallasch, C. Goode, and J. Milne (Hon. Sec.).

BEST BINDERS AND MOWERS.—Port Elliot Branch wrote, asking members to advise which, in their opinion, are the best binders and mowers for general purposes in the market. After a long discussion it was resolved unanimously to recommend the Hornsby first and Massey-Harris second. [This must be accepted as the opinion only of the above members. Other Branches may have other opinions.—GEN. SEC.]

SEED DRILL.—Several members consider the roller bearings about the Farmers' Favorite to be a failure.

Belair, June 8.

Present—Messrs. O. H. Nootnagel (chair), H. Halstead, John Halstead, W. J. Bartlett, and G. R. Laffer (Hon Sec.).

DEAD WOOD IN PEACH TREES.—Mr Halstead was informed that a quantity of dead wood in his peach trees was probably due to want of light and sun, combined with neglect of proper pruning.

PEACH APHIS.—The Hon. Secretary said some of his peach trees were already badly affected with peach aphis (Myzus cerasi)—a most unusual circumstance at this time of year. [Spray with a decoction made by boiling 3ozs. waste tobacco, or one stick black tobacco, with 3ozs soap in a gallon of water, or else fumigate with tobacco smoke under a tent. Bare the roots for 9in. from the stem, and wash them with above decoction, using a tar brush for the purpose.--GEN. SEC.]

Bowhill, June 16.

Present—Messrs, A. Dohnt (Chairman), W. G. F. Plummer, J. Waters, E. Weyland, N. P. Norman, W. Towill, F. H. Baker, A. R. Dohnt, F. A. Groth (Hon. Sec.), and two visitors.

COMBINED BRANCH SHOW.—It was decided to unite with Forster Branch in holding a show of products of the district during September.

BEST WHEAT FOR DISTRICT.—Mr. Towill was of opinion that Dart's Imperial wheat was the best for this district. Mr. Weyland reported that the wheats received from Central Bureau were doing well.

POULTRY.—Mr. Towill gave an instructive address on this subject. Farmers should keep only good laying strains, and look after the eggs properly, especially in summer. Mr. Norman considered that with eggs at 1s. 3d. per dozen it would pay to feed wheat at 3s. 6d. per bushel to fowls.

OFFICERS.—A hearty vote of thanks was accorded to Messrs. W. G. F. Plummer and H. H. Plummer, who are leaving the district; they have occupied the positions of Chairman and Hon. Secretary respectively for an extended period.

Forster, June 12.

Present—Messrs. A. Johns (Chairman), J. Johns, W. Johns, F. Johns, J. Sears, F. Towill, J. Retallack, W. Sears, J. Childs, C. R. A. Schenscher, J. A. E. Schenscher, C. Bolt, J. D. Prosser (Hon. Sec.), and one visitor.

Officers.—Past office-bearers were thanked, and Messrs. J. Johns elected Chairman and J. A. E. Schenscher Hon. Secretary.

Sowing Wheat.—Mr. J. Sears said a great deal more care than is usual should be taken in sowing wheat evenly. In hand-sowing the hand should be carried in the right position, with the fingers the same distance apart. Other members gave Mr. Sears credit for his evenly-sown fields. Many members favor the drill for sowing grain.

Rainfall.—For May, 1·24in.

Nantawarra, June 15.

Present—Messrs. E. J. Herbert (Chairman), C. Belling, S. Sleep, A. L. Greenshields, Jas. Nicholls, A. F. Herbert, R. Uppill, and T. Dixon (Hon. Sec.).

Bulls.—Members were of opinion that the stud bulls at present owned by the Department should be passed on on loan to Branches which had not had the loan of one. [As there are five times as many Branches as we have bulls, it would take so long to pass them round that some of them would be of no use by the time the last Branch got one.—Gen. Sec.]

Annual Report.—The Hon. Secretary read a short report on work for the past year. Messrs. Jas Nicholls and C. Belling were elected Chairman and Vice-chairman, respectively, and Mr. T. Dixon re-elected Hon. Secretary, the retiring officers being thanked for their services.

Morgan, June 9.

Present—Messrs. R. Windebank (Chairman), H. Hahn, R. Wohling, J. Arndt, C. Moll, and J. Wishart (Hon. Sec.).

Bulls.—Members support the suggestion of Central Bureau that a subsidy be given by the Department to Branches purchasing pure-bred bulls for use in the district

Rabbits.—Resolved that immediate action by landowners in this district to destroy rabbits be urged, as the early green feed favors a rapid increase of this pest.

Angaston, June 9.

Present—Messrs. F. Salter (Chairman), A. Friend, A. Sibley, R. Player, S. O. Smith, A. Salter, F. Thorne, J. Vaughan, P. Radford, and E. S. Matthews (Hon. Sec.).

Fruit Inspector.—This Branch disapproves of the appointment of any person as fruit inspector who has any pecuniary interest in the export trade, and they consider that certificates of inspection should be granted in the districts concerned, as it is impossible for an inspector in an adjacent district to be in half a dozen places at one time.

Pruning the Vine.—Mr. S. O. Smith read the following paper:—

I do not propose in this short paper to start with the vine in its earlier stages; most, if not all, here know the correct method of forming and shaping a young vine on the gooseberry principle.

What I should like to see in a district having a rich subsoil such as we have here would be a greater extent of trellising and more varied methods, for I cannot agree that we should follow necessarily any and every authority who turns up periodically with a new and only correct method. Most certainly give any idea that strikes you as being practicable and improved a fair trial, but our acceptance of a new form of pruning and trellising must be regulated largely by the conditions of soil and climate. I noticed that in some of the loose drifty sand country of this district a good deal of single-wire trellising on a 1ft. peg or post has been done, and the only thing I am sure that has struck the owner of that property is that the work was done cheaply in the first place; but the cheapness would not compensate him for the quality of the grapes, which, during windy weather, are so beaten by the driven sand as to seriously retard their growth. A one-wire trellis 2ft. 6in. high I have found extremely profitable in sandy ground where the growth is not too vigorous. One block of two and a half acres Cabernet, grafted on old Sherry stocks, grew vigorously, and I found that with one wire I could not allow enough wood the second year if I cut out the old rod, so left it and spurred heavily, at the same time cutting out all former spurs from the crown of the vines - in fact, leaving only two old rods. The result was in 1899, which was a drought-afflicted year, that block produced 2 tons to the acre, and at £7 per ton it does not require a great amount of comprehension to see that trellising on that plan pays. By keeping an account of the cost of that trellis I was able to prove that in the first year alone the whole outlay was defrayed by the extra crop.

Riesling treated the same way that year paid £1 over and above the whole cost of £10 for trellising. That is, there were £11 worth more grapes on that patch that year than there had been since planting fourteen years before.

The currant has had a good deal of attention in this district for a good many years, and various methods have been adopted in trellising. Until a few years ago the plan was a sort of go-as-you-please. The vine grew as it liked, and not as its owner liked. Now, I am happy to say, we have a system so simple that every vine is as nearly as possible alike, and in a very short time, with a little teaching, anyone can prune them.

One system, "Sylvoz cordon," strongly recommended by Professor Perkins and largely adopted, has turned out unsatisfactorily, in this district at any rate. I tried it for three years, and gave it up in favor of the spur on the cordon, which is much cheaper in labor, and just as effective as to crop.

No doubt most of us have seen the overhead trellised currant in Mr. C. Doddridge's garden, and noticed the enormous crop carried by it. I am treating a small area on the same principle this year, and am preparing to do about two and a half acres next year The plan I propose to adopt will make the pruning as simple as the present arm and spur style at present in use. I have my vines 12ft. apart in good soil; the trellis will be 6ft. above ground. The arch will be formed of jarrah battens cut in two and bolted where cut, and, being a little longer than the width of the rows apart, will give a hip or gable of about a foot. This will prevent sagging. Every alternate vine will be taken up in the usual manner about 3ft. high and run along the wire past the next vine, in all 24ft. The second and every alternate vine again will will be taken up to the wire on top and run along 24ft., rods taken from it at distances of 3½ft. to 4ft., and up to the top of the hip; this distance will prevent too much shade. These shall remain as permanent arms and be spurred. This I think will so simplify the pruning that a man on a box or short steps will be able to get over a lot of work without the usual worry as to how much wood to leave or where to leave it. Any new ideas members may have on the currant should be thoroughly ventilated at our meetings, for up to the present there are very few of us who have had an altogether successful time with present methods.

Mount Gambier, June 9.

Present—Messrs. Jas. Umpherston (Chairman), Jas. Bowd, W. Mitchell, W. Barrows, T. H. Williams, M. C. Wilson, John Watson, J. C. Ruwoldt, and E. Lewis (Hon. Sec.).

SHEEP-STEALING.—A circular from the Kowree Pastoral and Agricultural Society, Victoria, suggests, legislation for registration of all buyers of sheepskins, with a view to prevent sheep-stealing. Mr. Williams said, if one-half the reports he heard in his travels of the losses of stock were true, this is a matter demanding some remedy, and the subject is well worthy the attention of the Agricultural Bureau. In reply to Mr. Watson, Mr. Williams said he thought that (probably owing to greater facilities), sheep-stealing is more rife in this and the adjacent Victoria district than in other parts of the colony. Mr. Mitchell thought if every seller were compelled to stamp or write his name on the inside of each skin he sold it would have a good effect. A petition is being circulated in Victoria, making the following suggestions, which the Mount Gambier Branch is desirous should be discussed by the various Branches of the Bureau, as well as at the Congress in September next:—

1. That any person buying sheepskins be obliged to have a special licence authorising him to do so.
2. That such licence be issued for a certain district only.
3. That the number of licences be limited according to the number of sheep in the district for which such licences are issued.
4. That every such licensed buyer shall keep a book in which an account of all purchases shall be entered, with the number of skins purchased, also all brands and distinguishing marks, and the name of the seller.
5. That such licence and book and skins shall be produced for inspection by the police.
6. That it be made punishable for any licensed skinbuyer to be found with skins of sheep in his possession having brands or distinguishing marks defaced, unless he can give a satisfactory explanation of the same.

HEALTH OF STOCK.—Mr. Williams said he had never known the sheep to be so healthy and so free from ticks and lice. This was due in a great measure to the care stockowners had taken in dipping. Cattle were healthy, except that there were a few cases of tuberculosis and impaction. Some cattle near Kalangadoo were suffering from chronic impaction, which often resembled "coast disease." In all his *post-mortem* examinations of "coasty" stock he had found worms present in the lungs, stomach, and intestines.

Mount Bryan East, June 9.

Present—Messrs. T. Wilks (Chairman), W. Bryce, E. T Prior, and W. Dare (Hon. Sec.).

LUMPY JAW.—Mr. Bryce wished to learn if a lump on the jaw of a beast is indicative of tuberculosis. [It is most probably the fungus disease known as actinomycosis, and can be cured by proper treatment if not too far advanced.—GEN. SEC].

HORSE COLIC.—Mr. E. Prior had a horse with symptoms of colic, and after being drenched with oil, discharged at the nostrils. The discharge had a bad smell. The horse had a cough, and when bled fell down as though in a fit, and was in great pain and prespired freely. [Mr. C. J. Valentine says you should not have administered oil, but should have given tonics if anything. It was also wrong to bleed the horse. I reckon that all animals require "the constitution of a horse" to withstand the awful treatment to which they are often subjected.—GEN. SEC.]

Amyton, June 7.

Present—Messrs. Joseph Gum (Chairman), Thos. Gum, A. Gray, John Kelly. H. Turner, R. Brown, S. Thomas (Hon. Sec.), and one visitor.

OFFICERS.—Chairman and Hon. Secretary were thanked and re-elected.

PLOUGHS AND RECENT IMPROVEMENTS.—Mr. Gray read the following paper:—

We are living in an age when the commercial world is going faster than ever, and competition is keener than ever it has been before. Men are studying and getting to understand more the laws of nature, and are making use of their knowledge in the production of labor-saving machinery to drive commerce faster. Every inventor tries to bring out machinery that exceeds his previous production, and that of other inventors. Agriculture, like all other branches of industry, has to advance with the times; consequently the tillers of the soil require to be in possession of the greatest agricultural time and labor saving machinery. When we remember that America is one of the greatest wheat-producing countries in the world, is close to England, our main market, and produces about a quarter of the wheat grown on the globe; and that Australia, and particularly South Australia, has to compete against a country with such a mammoth production, we realise that unless our farmers use machinery that will enable them to do the best work, and produce the largest quantity in the shortest time, with the smallest possible expense, they will be unable to run in the race with America. Amongst the various agricultural tools used by our South Australian farmers, the first and perhaps the most important is the plough. To the farmer it is an indispensable tool. Whatever other implements he may dispense with, the plough he must have: for until his plough has been at work his other agricultural implements are not required. The first plough that I saw, nearly forty years ago, was a wooden plough with one wheel, worked by two horses. After the wooden plough came the iron swing plough with one wheel, and sometimes worked without a wheel. Then came the iron two-wheel plough; after that the double-furrow plough; then the multiple plough, followed by the jump plough; and recently has come the paring plough, or better known as the skim plough; and the most recently come out is the steel jump skim plough. Amongst the various kinds of ploughs invented during the past fifty years, the jump plough is the most valuable; for by the aid of jump ploughs large areas of rough stony country, and thousands of acres of timbered land have been brought under cultivation, some of it good land, but which it would not pay to grub, clear, and cultivate with the ordinary fixed plough at the present price of wheat There are two kinds of jump ploughs, stone jumpers and stump jumpers. Stone jumpers will not work satisfactorily in stumpy land, but stump-jumpers may be worked in both stumpy and stony land. There are some farmers who have stone-jumping ploughs and think they are working stump-jumpers. In the best stump-jumping ploughs the share is set well in front of the body main pivot bolt. The teeth of a horserake jumps more freely, with a better sweep, and is less liable to hook in an obstacle when the points are set well past the head bar, and the same principle is applied to the best stump-jump ploughs. On some ploughs at Morchard, made by Mr. Francis, there were several improvements which add to their value. They were made of spring steel, which should be preferable to iron, because steel is lighter, stiffer, and stronger than iron. Some of them were also fitted with seat and footboard, and the end of the lever to take the plough out of the ground when desired, instead of being set back, is set forward and can be easily worked with one hand from the seat by the driver when riding on plough. The frame of the plough is carried on four wheels—two in front, which are steered and turned by the draught, and two large main wheels under the main part of the body, which take the ploughs out of the ground when required These main wheels are set well back, which the maker and those who are using his latest improved ploughs says makes the ploughs run more steady and keeps them better up to their work. The jumping beams to which the share bodies are clamped are of spring steel, doubled and both ends brought back behind, between which the share bodies and the draught hooks are not bolted but clamped, and this allows their being shifted if desired to regulate their jumping. When the jumpers get too much room by reason of wear, as they must all do in time, the clamps allow of a piece of thin iron being clamped in with the body, filling up the room caused by wear. Another small but useful improvement is a steel stay from the body of the plough to the middle of the front draught lever bar to prevent the bar from bending back in heavy stump land. The mouldboards are short and well turned. A ten-furrow jump skim plough is also made by the same maker on the same principle. The main fault is that the tines or bodies are too close behind each other to work well in wet or very loose soil, but I have been assured that there are a number of them working around Morchard giving satisfaction. The bodies are only about 10in. behind each other. I have used a fixed skim plough for some years, and my experience has been that a skim plough set to a [illegible]in. cut with the shares 13in. behind each other will not work satisfactorily except in dry soil, and then not well. I think that the difficulty in maintaining the narrow cut, and at the same time giving a greater distance for the shares behind each other, in both fixed and jump skim ploughs, can be overcome by making the main frames longer. A seven-furrow stump-jump plough in Booleroo, made by Bews, which is called a "skim plough," is heavier than any other skim plough that I have seen; it is more a light ordinary stump-jump plough than a skim plough. It is set to 8in. or 8¼in. cut, with each body about 13¾in. behind each other. The mouldboards are 13in. deep in the breast from the share, and average 14in. in length, with a good even twist, bolted in front to the body, and fixed also to the body at the back by a small stay, are set up clear of the bottom of the furrow, and should do good work and pull lightly. The shares are a piece of ⅜in. steel plate, cut to 6½in. and 13in. by 4½in. wide, thinned on the long side, and fixed to the point of the body by two bolts. The greatest point in this plough worthy of notice is the size, shape, and set of the mouldboards. In past years the the greatest number of ploughs have been made with wide cuts—9in., 10in., and 11in. have been common widths—and I have known ploughs made to cut 12in., the mouldboard set down to drag hard on the bottom of the furrow, and made to do some of the work which the share should do by pushing over the ground, which was too wide for the share to cut, thereby increasing the draught and wearing out the lower edge of the boards. An ordinary Pn 17 share is only 7⅞in. wide, and a plough to cut all the weeds, turn over all the furrow, and pull lightly should have the mouldboards set up clear of the bottom of the furrow and be set no wider than the share can cut. In skim ploughs the furrows should not be as wide as the shares. In open country and on clear land the fixed skim plough may yet be used as a plough, seedsower, and fertiliser combined. The seed and fertilising drill is a very useful implement, has done and is doing wonders for the agriculturist; but the land has first to be ploughed and prepared before the drill is put on to it. By having a drill seed and fertilising box attached to the skim plough the ploughing, sowing, and manuring may be completed in one operation, and by it much time and labor saved. Mr. Smith, of Ardrossan, showed a stump-jump plough at Adelaide Show last September, which appeared to be very strong and heavy, but a good model. It had a seed-sowing box attached in front, arranged so that the seed would be ploughed in as it is sown, which is no doubt a useful invention, especially for cultivating stump land, and a means of preventing sparrows and other birds, which are generally numerous in timber country, from eating the sown grain, and ants from gathering in heaps the seed before it is covered; and also a means to prevent strong wind from affecting the even planting of the seed, as is often the case in broadcast sowing. But a plough that will deposit every grain of seed in the furrows behind the shares, instead of on the land in front, will be preferable to Mr. Smith's invention. The popular objection to ploughing in the seed is that the seed is deposited too deep to be of any benefit to a crop; but for several years I sowed broadcast, and used a skim plough in place of harrows to cover in the seed, and have found it a great improvement on the old system of ploughing and then sowing and covering in the seed with harrows. Notwithstanding the prevailing dry seasons, which have been unfavorable to experiments, the results of my experiments have satisfied me that in any season wheat covered in with the skim plough will give better results than wheat covered in with the harrows; and it is a question whether the skim plough will not in time largely supersede the seed and fertilising drill in country favorable to the use of the skim plough It makes very little difference whether wheat is planted 1in. deep or deposited under 3in. of soil, except that the deep planted will take longer time to come above the ground. Wheat that is planted with about 1in. of soil above it, as I have already said, will come above the ground in less time than if planted deeper, but all the roots will be near the surface, and near harvesting time, when the ears become heavy with grain, the heavy winds, blowing first from the north then from the south, cause the plants, which have no taproots, to partly draw their roots, and eventually drop over, often too low to be picked up with the reaper. Wheat that is ploughed in 3in. deep, after it has come up will put out surface roots at from ½in. to 1in. below the surface, by which it will chiefly feed and maintain itself; and near harvest time, when the ears are heavy with grain, it will not drop over anything as badly as wheat that is planted shallow, because the 2in. of first stem between the first or bottom roots and the top or surface roots is a taproot to the plants, and helps to keep them upright. On the plains of these Northern Areas, where the land is clear and easily worked, I think our farmers, with such an economical implement as the drill skim plough would be, could save much time and greatly reduce their farming expenditure; and we may hope and expect in a very short time to see such time, labor, and money saving implements as these ploughs would be at work amongst the farmers of South Australia.

Members recognised that the lever, being fixed so that the depth may be regulated from the driver's seat, is a distinct improvement. Some think a larger mouldboard would remedy the unsatisfactory work done by the skim plough, and not, as Mr. Gray suggested, a larger-framed plough, with the shares wider apart. The mouldboard at present is too small to turn all the soil cut by the share, but spills it in all directions. They agree that the skim plough, with seed-drill and fertiliser attached, is quite equal to, and in some cases would be preferable to, the drill, as they work the land better.

Mundoora, June 15.

Present—Messrs. R. Harris (Chairman), W. D. Tonkin, D. Smith, J. Loveridge, W. Aitchison, W. Mitchell, W. J. Shearer, J. J. Vanstone, C. Burton, T. Watt, D. Owens, W. Haines, and A. E. Gardiner (Hon. Sec.).

Bulls.—This Branch strongly approves of the principle that any co-operation provided by subscription for purchase of pure dairy bulls for improvement of dairy herds in any district should be aided by a subsidy from the public funds, provided that said bull is available for reasonable service at a moderate fee. Members spoke feelingly of the damage done to fences, and in various ways by bulls allowed to run at large, and are desirous that this state of things shall be remedied in future.

Sheep.—The Chairman agreed with Mr. Ifould's recommendation that those farmers who are able should keep a few sheep. They keep down weeds, as well as bring in a little income, and help to restore fertility to the land.

Mr. Vanstone said he had often heard it stated that sheep renewed the fertility of the land, but it had never been explained how this was effected. Looking at it from a reasonable point of view it seemed impossible that the land could be richer after so much wool and mutton had been removed from it. Other members thought the land is enriched by the droppings from the sheep and the consumption of the weeds. [The droppings are obtained from the field, and are returned to the field, less the portions converted into bone, wool, and mutton. —GEN. SEC.]

A GIGANTIC WHEATGROWERS' COMBINATION.—The Chairman read a clipping which is being published in newspapers concerning a proposition that is to be considered at the Paris Exhibition early in July by farmer delegates from all parts of the world. The proposal comes from America, and aims at a combination of all farmers to restrict wheat production by 20 per cent., and never to sell for less than one dollar per bushel. [When every farmer in the world develops wings and an angelic disposition it may be possible that such a combination might become perfected; but in that case, it would be for the production of all that the land would yield, so that want and misery should not exist on the face of the earth.—GEN. SEC.]

Watervale, June 11.

Present—Messrs. G. Hunter (in chair), S. Solly, G. Holder, W. Smith, G. Perrin, H. Scovell, E. Treloar (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. Scovell tabled two pears, name unknown and of inferior character. One had been picked and stored and the other left on the tree, the former being tough and flavorless and the latter quite green and rather juicy. Mr. Perrin showed Shockley apples of good quality, considered to be about the best keeper. Mr. Scovell also showed two nice eating apples, name unknown.

APPLES.—Members complained that their apples, though given every care and attention, did not keep well this season.

Yankalilla, June 21.

Present—Messrs. E. C. Kelly (Chairman), Alex. Wood, H. Leverington, J. Tonkin, Dr. A. J. Meikle, J. Grundy, and G. H. MacMillan (Hon. Sec.).

BULLS.—The members unanimously supported resolutions passed by Central Bureau *re* pure-bred bulls for Branches, but they do not approve of the suggestion to extend the principle of the Department subsidising purchase of pure-bred stock to sheep and swine; and, while regretting the deterioration of horse stock, consider the purchase of entire horses would be too costly for either the Government or the Branches to undertake.

HORSE-BREEDING.—Mr. Tonkin introduced discussion on this subject. In the opinion of the members great deterioration in the quality of our horses generally had taken place during recent years.

Maitland, June 2.

Present—Messrs. A. Jarrett (Chairman), H. Bawden, Thos. Bowman, J. Kelly, O. Treasure, W. Wilson, H. R. Wundersitz, C. F. G. Heinrich, and C. W. Wood (Hon Sec.).

HON. SECRETARY.—At special request of members Mr. Wood agreed to take the position of Hon. Secretary until some suitable person willing to take the position could be obtained. Members regret the absence of visitors from their meetings.

CODLIN MOTH.—The Hon. Inspector of Fruit Pests stated that he had found codlin moth to be present in two gardens in the district, including his own garden. It was stated by members that affected apples brought from Adelaide were not infrequently sold in the township. [And so this pest is spread throughout the country by the ignorant or wilful carelessness of the owners of gardens known to be infested.—GEN. SEC.]

Gawler River, June 15.

Present—Messrs. A. M. Dawkins (Chairman), J. Badman, C. Leak, A. Bray, F. Roediger, R. Badcock, J. Drinkwater, J. Hillier, T. P. Parker, D. Humphries, W. Clark, J. Barrett, H. Roediger (Hon. Sec.), and three visitors.

JERSEY CATTLE.—Mr. J. G. Dawkins read a very practical paper on this subject. In answer to questions, he said a first cross with a Jersey bull answered very well; but to go further is a mistake. A Jersey cow will give more butter from a certain quantity of feed than will be given by a larger framed cow.

OFFICERS.—All the officers for past year were thanked and re-elected.

EXHIBITS.—Mr. A. Bray tabled immature fruits of Osage orange (Maclura aurantiaca), a plant used for tall hedging, or when given enough room, growing to a large size and producing valuable timber. Mr. C. Leak tabled Lettuce-leaved and Jersey Lily turnips of large size and good quality.

Balaklava, June 9.

Present—Messrs. P. Anderson (Chairman), C. L. Reuter, A. Manley, E. Hams, A. W. Robinson, W. Smith, A. Hillebrand, G. Reid, and E. M. Sage (Hon. Sec.).

OFFICERS.—Messrs. P. Anderson and E. M Sage were re-elected Chairman and Hon. Secretary respectively for ensuing year. It was decided to send letter of condolence to family of Mr. J. Mills, late a member of this Branch.

KAFFIR CORN.—The Hon. Secretary tabled plants of red Kaffir corn, and Sorghum halepense giganteum, also bunch of white Milan turnip, grown from Bureau seed. The red Kaffir corn was 4ft. 6in. high, but the seed had not ripened ; sorghum was over 3ft. high, and had been cut down once by mistake. The turnips were 15in. in circumference, grown in seed bed and transplanted. All these were grown on ordinary mallee land over limestone rubble. Members had been able to grow nothing equal to these exhibits and thought the Hon. Secretary's land must be extra good.

FODDER FOR SHEEP.—Mr. Robinson read a paper on "Provision of Fodder for Sheep," to the following effect: —

In a season like the present, when after the early rains many began fallowing before seeding, the question arises, could not this early fallow be put to some profitable use. I think it could in the following manner—providing green feed for ewes and lambs. It seems to me a very expensive way of farming to allow our fallows to remain practically unprofitable for eighteen months. At one time many of us thought we might grow a summer crop, such as sorghum, but we found our summers too dry; where one crop has been a success dozens have ended in failure. Having finished seeding this year by the 25th May and having 60 acres of fallow, I worked the fallow down with the harrows and drilled in 1bush. of Chevalier barley per acre. Under favorable circumstances this will provide good feed for ewes and lambs during August and September, and may be fed off three or four times. The barley will be fed off on the land, giving it a thick coating of manure, and the land will then be in good condition for wheat next year. In Ooctber this barley will be scarified out, and the land worked down as an ordinary fallow. Many people ask "What is the use of providing feed in August and September when there is always an abundance of it?" This may be answered by inquiring into the cause of our pasture lands becoming so destitute of feed. It is because they are not allowed to seed, and until we sheepfarmers recognise the fact that it is necessary to allow our paddocks to mature their seeds periodically our lands will never regain their stock-carrying capacity. Then it can be observed that my aim is to have the minimum number of stock on pasture land when it is going to seed.

Mr. Manley stated he had grown rape successfully. Mr. Smith thought the loss of moisture would not be compensated for by having feed; but Mr. Robinson, while he admitted there would be some loss of moisture, pointed out that it was not altogether like a summer crop. The Hon. Secretary said he had never experienced a failure with his sorghum crops. Members thought the experiment suggested worth trying.

Caltowie, June 11.

Present—Messrs. J. G. Lehmann (Chairman), J. Potter, D. Wilson, G. Becker, J. Neate, S. Wenham, G. Petatz, A. McCallum, A. Kerr, L. Graham, J. A. Leahy, J. H. Both, E. M. Wilson, and A. McDonald (Hon. Sec.).

OFFICERS.—Past officers were thanked. The Hon. Secretary was re-elected, and Mr. A. Kerr elected Chairman and Mr. S. Wenham Vice-Chairman.

BUSINESS.—A lot of routine business and correspondence was gone through.

Bute, June 12.

Present—Mr. H. Schroeter (Chairman), W. H. Sharman, J. H. Barnes, A. Schroeter, R. C. Commons, W. Hamdorf, E. Ebsary, W. Sluggett, D. Green, W. Langsford, M. Stevens, S. Lamshed, M. Hall, and A. Sharman (Hon. Sec.).

FIELD TRIAL.—The Field Trial Society in connection with Branches in this locality is offering money prizes to first awards at the forthcoming trial.

OFFICERS.—Past officers were thanked. Mr. H. Schroeter was elected Chairman, Mr. W. Sluggett Vice-Chairman, and Mr. A. Sharman Hon. Secretary.

EXHIBIT.—Mr. D. Green tabled excellent lemons and oranges grown on his farm.

Pyap, June 20.

Present—Messrs. J. Bowes (Chairman), W. Axon, J. Harrington, J. Holt, E. Robinson, C. Billett, J. Napier, and W. C. Rogers (Hon. Sec.).

BULLS.—Members approve of suggestion that a subsidy of £1 should be added to each £1 raised by subscription for purchase of pure-bred dairy bulls for use in any district.

LICENSING OF BULLS AND STALLIONS.—Members agree with Mr. Homburg's suggestions, *i.e.*, as reported in *Journal of Agriculture* of June, 1900, page 919, and hope that he will be successful in any Bill he may introduce in Parliament.

Finniss, June 4.

Present—Messrs. W. W. Heath (Chairman), S. Eagle, H. Langrehr, S. Collett (Hon. Sec.), and five visitors.

SEED SAVING.—In a discussion on "Seeds—When, How, and What to Save," members considered it advisable to save seed from the first fruits of the season, always selecting good sound examples, dry seed in the shade, and keep it air-tight in a bottle. It has been found desirable to take onion seed only from two-year-old stock.

Kadina, June 14.

Present—Messrs. T M. Rendell (Chairman), D. Kennedy, Thos. Warren, M. Quinn, H. Johnson, S. Small, D. Taylor, and J. W. Taylor (Hon. Sec.).

METEOROLOGICAL.—Mr. F. Potter, of Kadina, forwarded an interesting paper on the rainfall, barometric and thermometric conditions during April and May, 1899 and 1900. Messrs. Williamson, Harris, Fowler, and Theim also gave particulars of the rainfall for May.

PERSISTENTLY ABSENT MEMBERS—Mr. D. Kennedy had noted the continued absence of a number of members from meetings of the Branch, and, as there were a number of good practical men desirous of joining, he moved that the Hon. Secretary shall strike off the roll the names of any members who fail to attend three consecutive meetings without sending a reasonable excuse. Carried.

TREATMENT OF HORSES.—Mr. Johnson made a few remarks on this subject. Some people, through kindness or want of knowledge, after a hard day's work, give the horse an extra quantity of food, in the expectation that the manger would be emptied, but the horse blows and snorts over the feed, and it then becomes distasteful. Horses that are regularly and moderately fed will do better than those which receive an excessive quantity. Horses are often worked after sundown, and they are then pushed harder than at any other part of the day. The horse knows when his day's work ought to be finished, and after then he is irritable and sweats freely. Coming home late, the driver often neglects to rub him down, and the cold sweat is found on the horse next morning. Work should start early and finish early. The Chairman said on Sundays the horse should have something better to eat than is usual on other days, and not be left to scrape up the remainder of the week's feed from the manger, as some people left them to do. Bran and chaff left in the mangers generally turns sour and has then to be thrown out. Animals die through want of proper attention to their food. Mr. Kennedy feeds good food regularly to his teams, and has always found that they consume one-third less food, but do more work than teams that are not fed with regularity.

TREE-PLANTING.—The Chairman directed attention to the almost criminal destruction of indigenous timber trees and to the neglect of tree-planting. Mr. Quinn remarked that there has been wholesale destruction of trees on roads, and even on Sundays people are to be seen busily cutting down the trees. The subject of tree-planting will be fully discussed at the next meeting of the Branch.

N.Y.P. BUREAU'S FIELD TRIAL.—Judges were appointed for this series of trials.

Brinkworth, June 6.

Present—Messrs. S. Aunger (Chairman), R. Cooper, A. L. McEwin, H. J. Shepherd, A. W. Morrison, G. Wooldridge, G. Freebairn, W. Wundke, J. F. Everett, C. Ottens, H. J. Welke, and J. Stott (Hon. Sec.).

TREATMENT OF SKINS.—Mr. Cooper read a short paper on "Skins, their Preservation and Treatment." He generally used an arsenic dressing to preserve the skins from insect attacks, and left the legs on, hanging the skins crossways on a rail until dry; then he removed the legs and folded the skins lengthways. Mr. McEwin also hung the skins on a rail, but scarcely thought it the correct treatment. Skins should be carefully removed to prevent damage, and be pegged out to dry. Mr. Aunger dressed the skins with lime as soon as they were taken off the body. Mr. Welke preferred a frame with holes for pegs, and the majority agreed with him.

ROPE-MAKING.—Mr. Heinrich, of Freeling, forwarded implement made by himself for manufacturing rope from waste binder twine and similar material, and members gave it a trial.

Tatiara, June 16.

Present—Messrs. T. Stanton (Chairman), A. Scown, F. Smith, H. Killmier, R. Penny, J. Rankine, and W. E. Fisher (Hon. Sec., *pro. tem.).*

BULLS.—Members consider it desirable that each Branch desirous to improve the dairy herds should subscribe for purchase of a pure dairy breed of bull, such subscription to be supplemented, pound for pound, by the State.

WOOL-CLASSING.—Members decided to attempt to get up a class in wool-sorting, under tuition of Mr. G. Jeffrey.

Naracoorte, June 9.

Present—Messrs. S. Schinckel (Chairman), J. D. Smith, E. C. Bates, H. Smith, Job Wynes, and G. Wardle.

OFFICERS.—Officers for the past year were thanked and re-elected.

EXHIBITS.—Mr. Schinckel showed a ploughshare made to his own design: the centre was cut out to prevent accumulation of sticky soil beneath. Also potatoes, Professor Maercker, Ehlers, and Thiel, planted in January in black friable soil of fair quality. The potatoes were of good quality. Mr. H. Smith tabled Buncome and Dunn's seedling (Munroe's Favourite) apples, of excellent quality. Mr. Wardle showed leaves of Jersey kale, having a peculiar small inner growth on them. Mr. Bates thought this was caused by a parasite. Mr. Smith had seen the same thing every year on his plants.

REPORTS ON SEEDS, &c.—It was resolved that reports on plants, seeds, etc., sent for experimental purposes be brought up and considered at the Branch meetings to be holden in January and July each year.

Johnsburg, June 9.

Present—Messrs. G. H. Dunn (Chairman), J. R. Masters, H. Napper, T. H. Thomas, J. Thomas, J. Read, L. Chalmers, P. Caughlan, J. Sparks, W. McRitchie, T. W. Smith, M. A. Read, T. Potter, T. Johnson (Hon. Sec.), and one visitor.

WHEATEN CHAFF AS A FODDER FOR HORSES.—The Chairman said several horses had died in the district, and he thought that the dry nature of the chaff assisted in the mortality. Owing to the ravages by the locusts last year the chaff was very inferior, and as there was no grain amongst it, the horses bolted it and so sustained injury. He always moistened the chaff about four to six hours before feeding it to the horses. Members agreed, but several thought chaffed straw preferable to wheat chaff, provided it is well moistened before use. Mr. Caughlan said either was unsuitable for horses doing trap work, but both were useful for horses doing steady farm work. Mr. Napper advocated use of plenty of salt, and a little linseed occasionally.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

ANNUAL REPORT.—Hon. Secretary read the annual report. Ten meetings had been held, with an average attendance of ten members and several visitors. Five papers were read, and many discussions conducted. A number of experiments with new seeds have been conducted, but have mostly failed through drought, the exceptions being Indian King and Bartlett's Crossbred wheats, both of which gave very good results. Splendid specimens of cabbages, mangolds, turnips, nectarines, potatoes, cauliflowers have been tabled by members, but were grown with aid of irrigation. The *Journal of Agriculture* has supplied a vast amount of valuable instruction to cultivators of the soil. The Branch has done good work for the district.

Eudunda, June 11.

Present—Messrs. F. W. Paech, M.P. (Chairman), H. Martin, C. Wainwright, H. D. Wiel, J. A. Pfitzner, and W. Marshall (Hon. Sec.).

THE FARM AND ITS PRODUCTS.—The Hon. Secretary read from *Journal of Agriculture*, paper by Mr. D. Roper, of Mount Remarkable Branch, on this subject, and some discussion ensued. It was generally recommended more care in the selection of stock of all kinds.

Clarendon, June 11.

Present—Messrs. J. Spencer (Chairman), W. Spencer, A. A. Harper, R. Hilton, H. Payne, W. Henty, J. Pilling, J. Piggott, J. Wright, J. Juers, A. Harper, W. A. Morphett, and A. L. Morphett (Hon. Sec.).

QUESTION BOX.—A number of questions were dealt with, the following opinions being elicited:—Spinach should be planted with the first rains; sow in drills about 6ins. apart. Jersey cows are the best for small holders in this district. The quantity and quality of feed required to make a cow produce 4galls. of milk daily would depend entirely on the cow. To keep slugs away from young plants, barley awns or soot sprinkled round the plants will answer.

Golden Grove, June 25.

Present—Messrs. T. C. McPharlin (Chairman), S. A. Milne, F. Buder, J. Ross, J. Woodhead, R. Smith, A. Robertson, W. Mountstephon, J. Anderson, A. Harper (Hon. Sec.), and one visitor.

DAIRYING.—Mr. Woodhead initiated a discussion on this subject. He deplored the lack of interest taken in dairying in this district, where conditions were so favorable. What little dairying was done was carried on in a very haphazard fashion. He found that half his land utilised for dairying operations paid him better than the half used for growing hay. It was imperative, however, that no inferior cows should be kept, and that the cows be fed liberally. He thought too much use was being made of Jersey blood, as this breed was not the most suitable for farmers. Good strains of milking Shorthorns would effect an improvement in their cattle. A man that did not keep stock was not a farmer. Personally he preferred dairy cattle to sheep, where the run is limited. Mr. R. Coles (visitor) gave some interesting information concerning his experience in dairy farming. He buys a lot of feed such as bran and pollard to supplement what he grows on his land, and last season averaged 9d. per pound for his butter, the cost of production, including rent and fair value for feed purchased and grown being just over 4d. per pound. An interesting discussion ensued, and it was admitted that there was no denying the fact that too little attention was paid to dairying, and that the time was coming when it would be necessary to engage in the industry. It was also agreed that dairying judiciously undertaken would be no less lucrative than interesting, the chief objection being the continuous attention required.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

The English Factory Laws.

CONTRIBUTED BY INSPECTOR BRANNIGAN.

I am indebted to a neat little volume by May E. Abraham, one of H.M. Superintending Inspectors of Factories, and Arthur Llewelyn Davies, barrister-at-law, for the following remarks on the English factory laws. Space will not permit of a lengthy *résumé* being given of this work and the various Acts under which the English factory laws are administered, but short extracts will be made from time to time of such portions as may prove instructive and interesting.

The introductory chapter of this little work gives a short account of the principal changes introduced into the law by the Act of 1895, which came into operation on January 1, 1896. The order of subjects adopted by all the Acts is here followed. First come alterations in the general law relating to factories and workshops, next special provisions affecting particular classes of factories and workshops, and lastly such miscellaneous innovations as seem worthy of special notice.

Under the head of sanitary provisions the prohibition of overcrowding is now for the first time made definite. A minimum space is now required of 250 cubic feet for each worker in a room, or 400 cubic feet during overtime. It was previously the practice of inspectors to require this amount of space, but in the event of a prosecution for overcrowding it was in each case left to the discretion of the court to determine whether there was danger to health from the number of persons working in a room. The Secretary of State has power to modify the proportion of cubic space to persons employed for any period during which artificial light (other than electric light) is employed, and to require a higher proportion for any particular process or handicraft.

By the new Act an attempt is made to regulate the sanitary conditions of premises on which outworkers are employed. The provisions on this subject do not come into effect until an order has been made by the Secretary of State specifying any particular classes of work and any particular areas to which they are to apply. So far as these provisions are brought into effect an employer is now made responsible, under certain circumstances, for the condition of the places in which his outworkers carry on work. An inspector may give notice to the employer that any such place is dangerous or injurious to health. Then, after the expiration of a month, if the employer continues to give out work to be done in the same place, and if the place is still dangerous and injurious to health, the employer is liable to a fine. It is immaterial for the purposes of this enactment whether the work is given out from a factory or workshop, or from a place which is neither a factory nor a workshop (as for instance, a tailor's shop where clothes are sold but not made), and whether the employer is the occupier of a factory or workshop or other place, or a contractor employed by the occupier. It may be anticipated that this new scheme will be first brought into effect with regard to one or more of the occupations in which it is already necessary for employers to keep lists of outworkers, that is, the tailoring, electroplate, furniture and upholstery, and file-making trades. A somewhat similar provision in the new Act, designed for the protection rather of the general public than of the workers, penalises an employer who causes or allows wearing apparel to be made, cleaned, or repaired in a dwelling house where any inmate is suffering from scarlet fever or smallpox, unless the employer was unaware of the existence of the illness and could not reasonably have been expected to become aware of it.

Other new sanitary requirements are also made by the new Acts. In factories or workshops where lead, arsenic, or any other poisonous substance is used suitable lavatories must be provided. Wherever in a textile factory humidity is produced by steaming or other mechanical appliances the maximum limits of humidity at various temperatures are to be fixed by the Secretary of State on the same principle as in factories to which the Cotton Cloth Factories Act applies. Wherever in a factory or workshop any gas, vapors, or other impurity is generated and inhaled by the workers to an injurious extent ventilation by the use of a fan or other mechanical means is made compulsory. Sanitary conveniences must be provided in every factory or workshop, with separate accommodation for persons of each sex where both males and females are employed.

Lastly "adequate measures" must be taken to secure and maintain a reasonable temperature in every factory or workshop. The Act lays down no standard to determine what measures are adequate or what temperature is reasonable.

Under the head of "Safety" the regulations for the fencing of machinery are made more precise. Young persons are for the first time prohibited from cleaning dangerous machinery while in motion, and due precautions are adopted to avoid danger from self-acting machines. A useful section deals with the subject of danger from fire. The general obligation, which previously applied only to occupiers of factories, to provide sufficient means of escape is extended to occupiers of workshops also. Occupiers of either workshops or factories may now for the first time be required, if so ordered by a court of summary jurisdiction, to provide sufficient movable fire escapes. Doors must not be so locked or bolted or fastened that they cannot be easily opened from the inside, and in all new factories or workshops rooms in which more than ten persons are employed must be constructed either with sliding doors or with doors that open outwards. By another valuable innovation courts of summary jurisdiction are now empowered, on the application of an inspector, to prohibit the use either of dangerous premises, or parts of premises, or of dangerous machines, until alterations have been effected removing the danger.

On the subject of employment the most important provision of the new Act is that which prohibits the overtime employment of young persons under section 53 of the Act of 1878. That section (which still authorises the overtime employment of women) applies to certain non-textile factories and workshops, in which there is a danger of materials being spoiled by the weather, or a liability to a press of work at certain seasons, or from unforeseen causes. The cases still remaining in which young persons may now be employed overtime (under sections 54, 55, and 57 of the Act of 1878) are comparatively few and unimportant. Women may still be employed overtime, not only under section 53, but also under section 56, which relates to a small number of factories and workshops (enumerated in schedule 3, part 6), where special precautions are required to preserve perishable articles. But the total number of days in the week and the total number of days in the year on which women may be employed overtime under these sections are both reduced by the Act of 1895.

Before the Act of 1895 there was no restriction under the Factory Acts on employment outside the factory or workshop, so that a child, young person, or woman who had already worked full time in a factory or workshop might be further employed on the same day by the same employer at home or elsewhere outside the factory or workshop. Now employment outside a factory or workshop in the business of the factory or workshop is prohibited (except during the authorised period) in the case of a child on any day on which the child is employed in the factory or workshop, and in the case of a young person or woman on any day in which the young person or woman is employed in the factory or workshop both before and after the dinner hour. In the case where the occupier of a factory or workshop also keeps a shop he must not employ a young person or a woman in the factory or workshop and in the shop for a longer period than is allowed for his or her employment in the factory or workshop alone. There is a similar provision in the Shop Hours Act, 1892, applying to young persons and children who are employed first in a factory or workshop and then in a shop to the knowledge of the shopkeeper.

Another section of the new Act authorises the employment of young persons and women in any non-textile factory and of young persons in any workshop from 8 a.m. to 8 p.m., with the ordinary interval for meals. Previously the period was from 6 to 6 or from 7 to 7, and employment from 8 to 8 was only allowed in exceptional cases. Employment from 9 to 9 is still exceptional.

The Act for 1895 for the first time extends certain of the provisions of the Factory Acts to several classes of premises where work is carried on under conditions similar to those existing in factories and workshops. First of these are laundries, which previously were subject to the Public Health Acts as far as their sanitary condition was concerned, but additional sanitary regulations and provisions as to hours of work and meals are included in the Act of 1895. The most important omission is that the special provisions of the Acts relating to period of employment and overtime have not been applied to laundries, which have separate regulations of their own on these subjects.

A miscellaneous group of premises, on which work is carried on at special risk of accidents to the workers, are brought under certain provisions of the Acts intended to minimise the risks. These premises are—first, docks, wharves, quays, and warehouses; and, secondly, premises on which a building is being constructed or structurally altered by means of machinery. With regard to all these premises special rules and regulations may be made under the Act of 1891 so far as concerns any processes certified to be dangerous; the use of dangerous machines may be prohibited; in case of accidents notices must be given, and inquiries may be held; and the employer may be made liable to make compensation to a workman injured by breach of any rule or requirement. Inspectors have power to enforce these provisions on these premises.

In a tenement factory, that is a building containing several factories separately occupied, the owner of the whole building has hitherto escaped responsibility. He is now made answerable, instead of the occupiers of the various parts, for the sanitary condition of the whole, the fencing of all machinery not supplied by the occupiers, and certain other matters falling properly under his control. He may also be put in the place of the occupier for the purpose of the provisions of the Act of 1891 relating to special rules for dangerous employments. The owner of a tenement factory where grinding is carrried on is also required to observe certain special regulations.

Bakehouses have previously been subject to special requirements, framed in the interests of the general public beyond those which apply to ordinary factories and workshops. Some of these (under the Act of 1878) have previously applied only to bakehouses in large towns, others (under the Act of 1883) only to newly-erected bakehouses. These have now all been extended to all existing bakehouses. Underground bakehouses are also now prohibited for the future, but, in accordance with the usual practice, an exception has been made for the present in favor of existing underground bakehouses.

Among the miscellaneous amendments introduced by the new Act, the most important is the new scheme dealing with the particulars of work and wages which must be furnished to work-people, in order that they may be able to calculate the amount of wages due to them. Particulars were first required to be furnished under the Act of 1891, but the new scheme is more comprehensive and more minute than the scheme under the earlier Act. It applies now to all textile factories, and it may be extended by the Secretary of State, with the necessary modifications, to non-textile factories or to workshops.

Besides the ordinary penalties to which an employer may be liable for breach of the Acts, the Act of 1878 provided that in case of death or injury to a workman caused by an employer's neglect to fence machinery or structures required to be fenced, the employer should be liable to a fine not exceeding £100 the whole or part of which might be applied by the Secretary of State for the benefit of the injured person or his family. This provision for penal compensation is now extended to all cases of death, bodily injury, or injury to health caused by the occupier's neglect to observe any provision of the Acts or any special rule or requirement under the Act of 1891.

Any case of lead, phosphorus, or arsenical poisoning occurring in a factory or workshop is now subject to the same regulations as an accident occurring there. Notice of such a case must be given to the Inspector and the certifying surgeon, and the certifying surgeon must make an investigation and a report. The occupier must keep a register of such cases. Any medical practitioner called in to attend such a case, if the poisoning or the anthrax was contracted in a factory or workshop, must report it to the Chief Inspector. The Secretary of State may extend these provisions to any other disease occurring in a factory or workshop.

The last provision of the Act of 1895 which seems to require special notice is that which empowers a person charged with an offence under the Acts to give evidence on his own behalf if he thinks fit to do so.

I. A. R. I. 75.

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